3.22

35th
YEAR OF
PUBLICATION

# Chemical Weekly

VOL. XXXV JULY 31, 1990 NO. 47

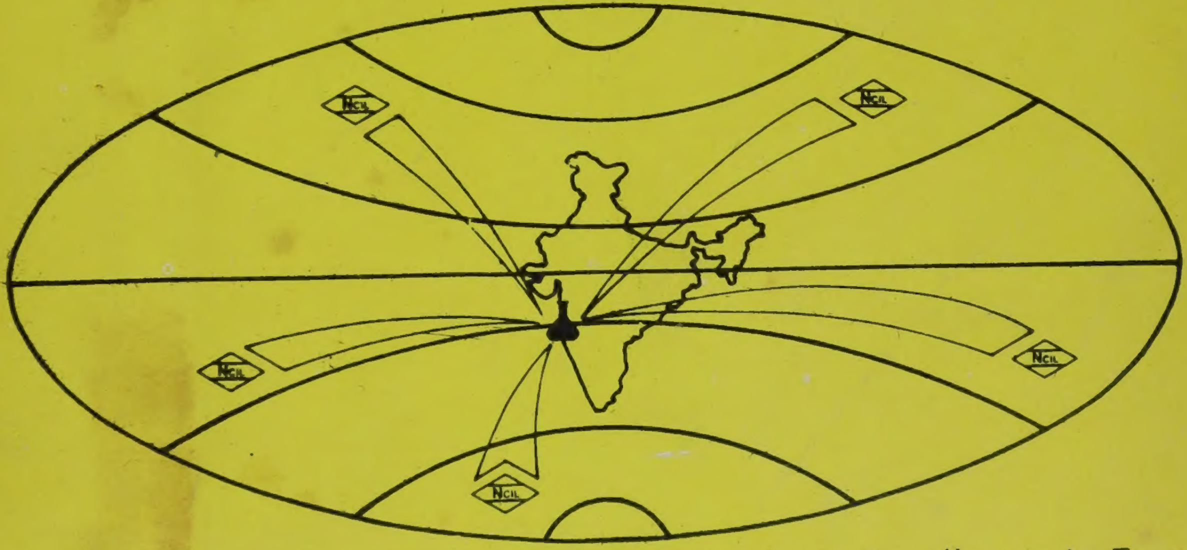
LIBRARY & DOCUMENTATION
UNIT
3 AUG 1990
C.F.T.R.I., MYSORE

ESTD. 1964

**Nukem CORPORATION**

## A Household Name For Methanol, Among The Indian Industries,

**Has Now Become An International Symbol For Quality & Service**



NCIL

## A Commitment to Excellence in Exports

**EXPORTS:**

- ★ Bulk Drugs & Pharmaceuticals
- ★ Dyes & Dyes Intermediates
- ★ Aromatic Oils & Preparations
- ★ Herbal Extracts & Preparations
- ★ Projects & Technology Transfer
- ★ Bio-Technology

**IMPORTS:**

- ☐ Pharmaceutical Raw Materials
- ☐ Dyes Intermediates
- ☐ Technology with Plants & Machinery for Import Substitutes in Chemicals & Pharmaceuticals

**EXPORT PROMOTION**

*Contact for further details:*

NUKEM
CHEMICAL INDUSTRIES LTD.
Head Office:
Sagar Mandir, Shivaji Park, 5th Road,
Bombay-400 016 INDIA.
Telephones: 456647 ● 453096 ● 451951
468037 ● 468038

- Mono Sodium Phosphate Crystal
- Mono Sodium Phosphate Anhydrous
- Di Sodium Phosphate Crystal
- Di Sodium Phosphate Anhydrous
- Tri Sodium Phosphate Anhydrous
- Tetra Sodium Pyro Phosphate
- Acid Sodium Pyro Phosphate
- Mono Potassium Phosphate
- Di Potassium Phosphate
- Tetra Potassium Pyro Phosphate
- Mono Calcium Phosphate
- Mono Ammonium Phosphate Pure
- Di Ammonium Phosphate Pure
- Di Ammonium Phosphate Tech.
- Sodium Acetate Crystal
- Sodium Acetate Anhydrous
- Zinc Acetate
- Lead Acetate
- Potassium Acetate

25 YEARS 1962-87

ACCI

**A. CHOKSEY CHEMICAL INDUSTRIES**

101, M.G. ROAD, FORT, BOMBAY-400 023.
TELEPHONE: 273868, 274006
CABLE: HEXAPHOS ■ TELEX NO. 11-3716 PHOS IN

Edited by R. Raghavan and published by N.R. Rajagopalan on behalf of owners, Sevak Publications, 306, Shri Hanuman Industrial Estate, Wadala, Bombay 400 031. Madras Office: Room No. 9, Wellingdon Estate, 3rd Floor, 24, Commander-in-Chief Road, Madras 600 105. Phone: C/o. 471659 and

SEE PAGE 39 FOR CONTENTS

C. F. T. R. I. MYSORE

**SILICA GEL**
(INDICATING/NON-INDICATING/COLUMN CHROMATOGRAPHY/THIN LAYER CHROMATOGRAPHY)

**ACTIVATED CARBON**
(POWDER/GRANULAR; CHEMICALLY ACTIVATED)

**PRECIPITATED SILICA**
(RUBBER GRADE/INSECTICIDE GRADE)

**ORTHO DICHLORO BENZENE**
**PARA DICHLORO BENZENE**
**ORTHO PHENYLENE DIAMINE**
**MONO CHLORO BENZENE**
**TRI CHLORO BENZENE**
**BENZYL CHLORIDE**

Butyl Stearate
Methyl Oleate
Cocoamine Oxide
Cocoanut Di Ethanolamide
Coco Mono Ethanolamide
Coco Amidopropyl Betaine
Octyl Stearate
Para Chloro Aniline
Coco Betaine

**ISO PROPYL MYRISTATE**
**ISO PROPYL PALMITATE**
**ISO PROPYL ALCOHOL**
**DIOCTYL SULPHO SUCCINATE LIQUID**

**DRIER CHEMICALS**

100, Dada Saheb Phalke Road,
Dadar (East),
BOMBAY 400 014 (INDIA)

Resi.: 4221658

Tel.: 4111051-4111661

Please Contact for Prompt Supplies Of:

**Anhydrous Ammonia Gas**

**IN CYLINDERS AND ROAD TANKERS**

**Also Available LIQUOR AMMONIA in Carboys and Tankers**

***Surat Ammonia Supply Company***

105, Regent Towers, Race Course Circle, Baroda 390 007.
**Phones: 323827, 321897 & 320676 * Gram: SASCO * Telex: 0175-497 SASC-IN**

**Ahmedabad Office:** M.H. ENTERPRISES, Plot No. 2018, GIDC, Vatva Phase II, Ahmedabad.
**Tel. No. Office: 336279, 348873**

**Ankleshwar Office:** J-3435, G.I.D.C. Estate, Ankleshwar-393 002, Gujarat State. **Phone: 2449.**

**Hyderabad Office:** SUPERCHEM AGENCIES, Godown No. 1, Behind Bakelite Hylam, Industrial Est
Sanathnagar, Hyderabad-500 018. **Telephone No. 263812.**

**Poona Office:** POONA GAS & CHEMICAL CO., Ratnakar, 8/16, Karve Road, Poona-411 004.
**Phones: 431110, 420330, 421695.**

**Vapi Office:** Shed No. 19, C-1, B. Type, Vapi Industrial Estate, G.I.D.C., Vapi-396 195. **Phone: 685.**

***BOMBAY AMMONIA & CHEMICAL CO..***

204, B-Wing, Neelam Centre, 2nd Floor, Hind Cycle Road, Behind Glaxo, Worli, Bombay 400 025
**Phones: 4948652/4948659/4949544/4946686.**

**The most reliable name in Chemica**

**DIAMINES**

**International quality** **Indigenously available**

AMINO ETHYL
PIPERAZINE (AEP)
- Epoxy Curing Agents
- Corrosion Inhibitors
- Asphalt Additives
- Emulsifiers
- Pharmaceuticals
- Surfactants

For
Rubber and
other Polymers,
Lubricating
and Fuel Additives,
Electroplating,
Mining and Metal Recovery,
Coating and Adhesives,
Surfactants and Softeners.

TETRA ETHYLENEPENTAMINE
(TEPA)

PIPERAZINE (PIP)
ANHYDROUS
Intermediate for
Pharmaceuticals,
Rubber Accelerators,
Corrosion Inhibitors
and
Surface Active Agents

From the only manufacturers in India
**DIAMINES AND CHEMICALS LIMITED**
International Quality with Indigenous Ingenuity.

**Ahmedabad (H.O) :** 1, National Chambers, Ashram Road,
Ahmedabad - 380 009 Phone : 409626 Gram : DIAMINES
**Baroda (Works) :** Plot No. 13, P.O. Petrofils - 391 347, Dist. B
Phone : 73305/406. Gram : DIAMINES Telex : 0175-352 DAC
**Bombay Office :** 85, 'C' Wing, Mittal Towers, 8th Floor, Narin
Bombay - 400 021. Phone : 2029507. Gram : CELAGAR

## IMPORTED RAW MATERIALS AVAILABLE
## WITH **MODVAT & DUTY DRAW BACK** BENEFITS

### PHARMACEUTICALS, COSMETICS FOODS

- PROPYLENE GLYCOL U.S.P.
- AEROSIL - 200 N.F.
- P.V.P. K-25/30/90 U.S.P.
  (PLASDONE/KOLLIDONE/POVIDONE)
- ETHYL CELLULOSE N.F.
  N-7, 10, 20/22, 45/50, 200
- METHYL CELLULOSE N.F.
  Grades: CULMINAL-MC 400, 4000 CPS
- HYDROXY ETHYL CELLULOSE
  Grades: NATROSOL 250 LR/GR/MR/HBR
- HYDROXY PROPYL CELLULOSE N.F.
  Grades: KLUCEL EF/LF/GF/HF
- HYDROXY PROPYL METHYL CELLULOSE
  U.S.P.-2910
  METHOCEL/PHARMACOAT/METOLOSE
  METHOCEL E3/E5/E15/E50, E-4M, F-4M
  METHOCEL K-100, K-4M, K-15M
  PHARMACOAT 603, 606, 615
- MICROCRYSTALINE CELLULOSE U.S.P./N.F.
  AVICEL PH 101/PH 102/RC-581/RC-591
- CROSSLINKED NaCMC, U.S.P.
  AC-DI-SOL (TABLET DISINTEGRANT)
- SODIUM STARCH GLYCOLATE U.S.P.
- CROSPOVIDONE U.S.P. (DISINTEGRANT)
  KOLLIDONE CL/POLYPLASDONE XL
- SODIUM CARBOXY METHYL CELLULOSE
  (FOOD/DENTAL/U.S.P. GRADES)
- TITANIUM DIOXIDE U.S.P. (SUPERWHITE)
  ANATASE GRADE - BACTERIA CONTROLLED
- CARBOMER/CARBOPOL 934, 940
- VEE GUM/VEE GUM HV
- XANTHAN GUM
- PARA CHLORO META CRESOL B.P.
  (PREVENTOL CMK - CHLOROCRESOL)
- P.E.G. 400/4000/6000/8000
- POLYPROPYLENE GLYCOL (P.P.G.)
- EUDRAGIT (ALL GRADES)
- DL-LACTIC ACID, 88-92%, U.S.P.
- POLYSORBATE (TWEEN 80) U.S.P.
- VANILLIN/ETHYL VANILLIN
- N-METHYL-2-PYRROLIDONE (NMP)
- TERTIARY BUTYL HYDROQUINONE
  (ANTIOXIDANT - T.B.H.Q.)
- OPADRY
- CELLULOSE ACETATE PHTHALATE U.S.P.
- HYDROXY PROPYL METHYL CELLULOSE
  PHTHALATE U.S.P.
- POLYVINYL ACETATE PHTHALATE U.S.P.

### BULK DRUGS INTERMEDIATES

- TETRAHYDROFURAN
- TERTIARY BUTYL AMINE
- N-PROPANOL PURE (Undenatured)
- HYDROXYLAMINE HYDROCHLORIDE
- ADIPIC ACID
- BENZALDEHYDE

PLEASE CORRESPOND WITH MR. MUKESH KAMDAR / MR. HARISH SHAH
AT

## CROWN CHEMICAL PRODUCTS

**AT OUR NEW OFFICE ADDRESS**

305-B, NEELAM CENTRE, HIND CYCLE ROAD, WORLI, BOMBAY - 400 025
TELEPHONE: OFFICE: 493 7725
493 7726
493 7727
493 4141
RESI: 409 3892
407 5245
646 3287
TELEX : 011-73926 CRWN IN
TELEFAX: 2040390

FOR YOUR REQUIREMENTS FROM READY STOCK:

**CHEMICALS:**

Thiourea
Hyflosupercell
Trichloroethylene
PVC Resin Suspension 67-D
Toshiba Silicon Emulsion
TSM-630
Ceto Stearyl Alcohol
Alfol 1618-H
Hydrogen Peroxide 20%
Cresylic Acid
Monoethylene Glycol
Methylene Chloride
Methyl Ethyl Ketone
Cellosolve Methyl
Acrylamide
Methyl Isobutyl Ketone
Glyoxal 40%
Peppermint Oil
Beta Picoline
L Lysine Monohydrochloride
Adipic Acid
Gum Rosin N Grade
Portable Generator
Paraformaldehyde 91% & 96%
Butyl Acrylate Monomer
2-Ethyl Hexyl Acrylate
Potassium Carbonate
Low Density Polyethylene
Hydrazine Hydrate 30% & 80%
Ammonium Persulphate
Polyvinyl Alcohol 173 &
GH-17
Laboratory & Reagent
Chemicals
Methyl Methacrylate
Pentaerythritol
Bromine Liquid
Citric Acid B.P. 80
Isopropyl Alcohol
Diethylene Glycol
Titanium Dioxide B 1
Rangolite 98%
Epichlorohydrine
Thymol Crystal
Cellulose Acetate Scra

**INTERMEDIATES**

Cyanuric Chloride
Benzaldehyde
Chrome Oxide
N-N-Diethylaniline
Naphthalene Crude
Sodium Formate
Sodium Chromate Yell

Please Contact:

**GUPTA TRADING COMPANY**
5, Apeejay House, 130, Apollo Street, Fort, BOMBAY - 400 023
Phone Nos. Office: 244403/222059 * Resi: 8229085/8121281
Gram: "CARPEDIUM

**H-ACID**

**Quality & Reliability**

From:

**SHREEJI COLOUR CHEM INDUSTRIES**
**(A Division of Himland Silk Mills Pvt. Ltd.)**

**Catering To The Needs of Domestic & Export Markets for over a Decade**

**Works:**
129/1/B, G.I.D.C.,
Nandesari - 391 340,
Dist. BARODA
**Tel.: 60214**

**Bombay Office:**
Oriental Bank Building,
Office No. 11 B, 2nd Floor,
M.G. Road,
Fort, BOMBAY-400 023.
**Tel.: 275916.**

NOW AVAILABLE:

96% A.D. DODECYL BENZENE SULPHONATE
(HARD ACID SLURRY)

LINEAR ALKYL BENZENE SULPHONATE
(SOFT ACID SLURRY)

SULPHONATED WITH SULPHUR TRI-OXIDE

TRADE MARK

MANUFACTURERS:

*Arochem Silvassa Pvt. Ltd.,*
Industrial Estate, Silvassa-396 230 -- Via Vapi,
Dadra & Nagar Haveli.
**Phone: 289, 291 Gram: AROCHEM SILVASSA**
**Telex: 0185 201 ARCM IN**

**BOMBAY** : Scent House, Station Road, Goregaon (West), Bombay-400 062.
**Phone: 6722280, Gram: AROSILVASSA, Telex: 011-78077 FAIS IN**
**KANPUR** : Chemdet Enterprises, Shop 67, 75/232, Sabji Mandi, Kanpur.
**Gram: SCENTOUS, Telephone: 64551**
**MADRAS** : Syndet Enterprises, 90, Govindappa Naick Street, Madras-600 001.
**Gram: SCENTOUS, Telephone: 569032**
**DELHI** : B. Shantilal & Co., 1025/5, First Floor, Gali Teliyan, Tilak Bazar, Delhi-110 006.
**Gram: INDOSIL, Telephone: 291 3973/0649**

*AVAILABLE REGULARLY*

***SPRAY DRIED 40%***
***A.D. ANIONIC DETERGENT***
***POWDER NEUTRAL-pH: 7-7.5***

**In Snow White Colour & Free Flowing**
**Bulk Density below 0.3**

Manufacturers

***Silvassa Syndet Private Limited***

Amli Industrial Estate,
SILVASSA - 396 230 -- Via Vapi,
Dadra & Nagar Haveli
**(Phone: 685)**

India's Multinational and Leading Consumers prefer only KGI's Gum
The top quality products
For Your Regular Requirements of:

**Gum Accacia**
(Powder & Crystal)

**Guar Gum**
(Pharma & All Other Grades)

**Gum Tragacanth**
(BPC Standard)

**Gum Arabic * Clove Oi**

WE CAN SUPPLY AS PER NEW I.P. 1985
WITH MICROBIOLOGICAL TEST

Please Contact

**KAPADIA GUMCHEM INDUSTRIES**

Together We Progress

G.P.O. Box No. 1160 3 Mint Road, 2nd Floor, Opp. G.P.O., BOMBAY 400 001
**Phones: 2611087/2615073/2617217 Resl.: 6205517/6207028 Gram: PHARMAGUM**
**Fax No.: 91-22-2612659 Attn.: Mr. RAMESH KAPADIA**

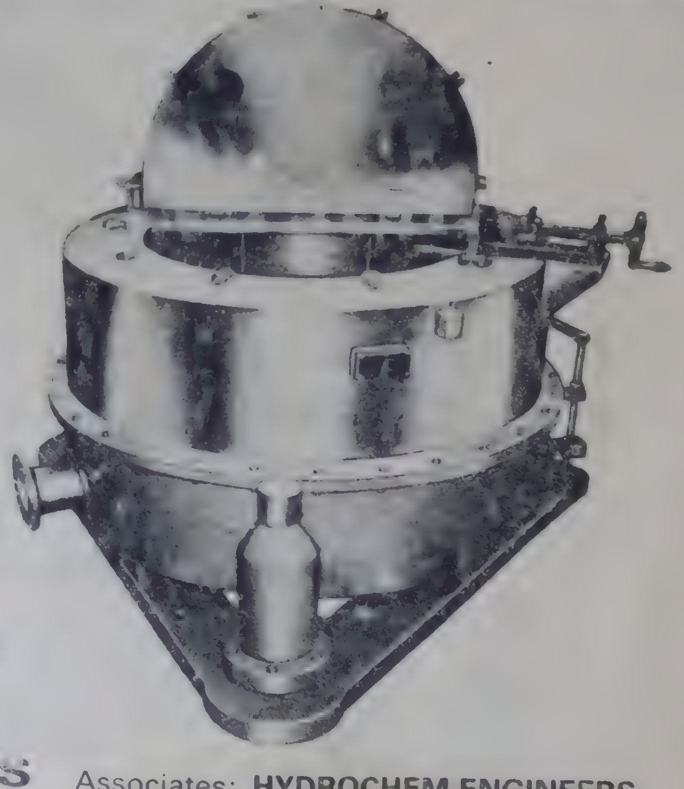
---

**NEW 'ROTEX' BOTTOM DISCHARGE CENTRIFUG**

*Introducing*

**With**
**1) Scrapper**
**2) Variable Speed**
**3) Efficient solid discharge system through single outlet in vapour tight condition.**
**4) Basket Dia range from 910 mm to 1520 mm.**

**ALSO AVAILABLE BAGLIFT TYPE AND MANUAL TOP DISCHARGE CENTRIFUGES MADE TO YOUR SPECIFIC REQUIREMENTS.**



**SUKHRAS MACHINES** Associates: **HYDROCHEM ENGINEERS**
Off. 145, Adarsh Industrial Estate, Sahar Road, Chakala, Andheri (E) Bombay 400 099 (INDI
Tel. 6322721, 6325957 Telex : 011-79179

**AVAILABLE REGULARLY**

**SULPHAMETHOXAZOLE**
**PARACETAMOL**
**OXYPHENBUTAZONE**
**IBUPROFEN**
**TRIMETHOPRIM**
**AMPICILLIN TRIHYDRATE**
**ANALGIN**

Please Contact

**BAJAJ ORGANICS (P) LTD.**

102, 'YOGESHWAR' 135/139, KAZI SAYED STREET BOMBAY 400 003

**Telex: C/o. 11-75969 BJAJ-IN** **Gram: CAUSTICLYE**
**Phone: 348406/335133** **Resi: 653581**

*Branch Offices:*

Arunodaya Apartments, 1st Floor, Room No. J,
7-1-70, Dharam Karan Road, Ameerpet,
HYDERABAD 500 016
**Telex: 425-2163 BJAJ IN**
**Gram: CAUSTICLYE**
**Phone: 228004/36472**

89, Chandan Society,
Opp. Yashoda Nagar Tekro
Ahmedabad-Bombay Highway
Yashoda Nagar
**Ahmedabad**
**Phone: 834546**

CONSUMERS & EXPORTERS CONTACT FOR YOUR REQUIREMENTS OF

**DIMETHYL SULPHATE**

**NOW AVAILABLE IN TANKERS TOO**

FOR PROMPT DELIVERY PLEASE CONTACT MANUFACTURERS:

**GANESH CHEMICAL INDUSTRIES**

74, Matru Smruti, Road No. 4, Scheme No. 6, Sion (East), Bombay-400 022.

Phone: 4077431/4077432/4077433/4076052

RICHARD

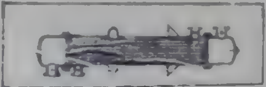
*'Just the one you need, A Product of Quality'*

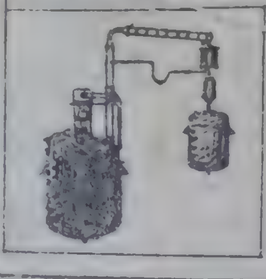
*FROM* **RICHARD ENGINEERING (BOMBAY) PVT. LTD.**

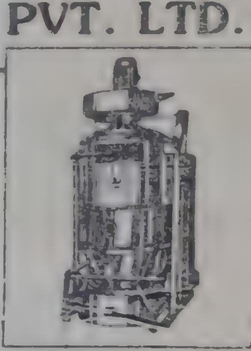
Who have a proven record of our two decades of experience in chemical equipment manufacturing and are known for Quality, Competitive pricing and delivery on time.

Our product range includes.

☐ FLUID BED DRYER ☐ TRAY DRYER ☐ DRUM DRYER ☐ FLAKER ☐ CENTRIFUGE ☐ LEAF FILTER ☐ PRESSURE FILTER ☐ PRESSURE VESSEL ☐ OPEN REACTION VESSEL ☐ REACTION KETTLE ☐ AUTO-CLAVE ☐ EVAPORATOR ☐ HEAT EXCHANGER ☐ DISTILLATION COLUMN ☐ CRYSTALISER ☐ BALL MILL ☐ BLENDER ☐ GRANULATOR ☐ STORAGE TANK (M.S., S.S., F.R.P., RUBBER LINED, ALUMINIUM AND LEAD BONDING) ☐ DISH ENDS ☐ HYDRO GENERATOR, OTHER CHEMICAL EQUIPMENTS







*CONTACT*

**RICHARD ENGINEERING (BOMBAY) PVT. LTD.**

ST/CST FREE!!

Office: 25, M.I.D.C. Chemical Zone, Ambernath. Pincode-421 501. Phone: 2513, 2785 Gram: RICHARD
Branch Office: 24, 1st Floor, South Usman Road, T. Nagar, Madras-600 017. Phone: 44 33 28
Factory: Plot No. C 10, Lote Parshuram Ind. Area Chiplune, Dist. Ratnagiri, Phone: 79, 279, 278.

*Available in Bulk Quantity and ready stock*

**FRUSEMIDE I.P./B.P.**
**FENBENDAZOLE**
**C.P. MALEATE**
**DIMETHYL AMINO ETHYL CHLORIDE HCL**
**MEBENDAZOLE U.S.P.-22**
**MEBENDAZOLE U.S.P.-22** (White)
**RIFAMPICIN**
**ALBENDAZOLE**
**FLUBENDAZOLE**
**DIMETRIDAZOLE (VET)** (for export)

WANTED LOCAL AGENTS/STOCKISTS IN UNREPRESENTED AREAS

**TRANSCHEM PVT. LTD.**
56, Ridge Road, Malbar Hill, BOMBAY 400 006.
Phone: 8123635 - 8128608 - 8117511 - 8113334

NOW AVAILABLE REGULARLY AT MOST COMPETITIVE RATES:

STARCH POTATO I.P.
STARCH SOLUBLE G.R./L.R.
STARCH SOLUBLE Bacto Grade
STERYL POTATO STARCH
SODIUM STARCH GLYCOLATE U.S.P.
FROM MAIZE/POTATO STARCH

CHOLINE DIHYDROGEN
CITRATE
PURE & 50%/70% SOLN.
CHOLINE BITARTRATE PURE
CHOLINE SALICYLATE PURE
TRICHOLINE CITRATE Min 65%

We also offer

(a) BARIUM CARBONATE (b) BARIUM CHLORIDE
(c) BARIUM SULPHATE POWDER I.P.
(d) BARIUM SULPHATE SUSPENSION 95% W/V B.P.
(e) BARIUM SULPHATE SUSPENSION 120% W/V B.P. (SWALLOW

Contact Manufacturers

**NATIONAL DRUGS AND CHEMICALS**

75, Jawahar Nagar, Goregaon West, Bombay 400 062.
**Phone: 6723224**

FOR YOUR REQUIREMENTS OF:

**INDOLE**
**ANETHOLE (99.9%)**
**MUSK XYLOL**
**(Powder & Crystal)**
**MUSK KETONE**
**PHENYL ACETIC ACID**
**ROSE CRYSTALS**
**LINALOL**

Please Contact:

**D.D. SHAH &CO.**

DAMODAR BUILDING, 105, PRINCESS STREET, BOMBAY 400 002.
TEL. NOS.: 31 20 55 / 29 35 54 / 29 05 74
TLX. NO.: 011-5732 DDS IN CABLE: FORENOON BOMBAY 400 002.

**The Planet Earth is the greatest chemist we know.**

What fecund and creative chemistry.
Every human, plant, animal, rock, gas or liquid on earth has a simple or complex chemistry behind it. The idea of so much thought and unconscious formulation seems mind-boggling, but Nature does it regularly and effortlessly.
It inspires us.

Process chemicals for the textile industry for Sizing, Desizing, Mercerising, Scouring, Dyeing, Printing and Finishing.

SUPERTEX ®

SUPERTEX ®
(INDIA) CORPORATION
132, Dr. Annie Besant Road, Bombay-400 018
Phone: 493 6041, 493 38 18, 493 5482.
Grams: 'Thinogum'. Telex: 75643.

a M G. Saraf Enterprise
Most trusted name in chemicals.

For most competitive quotation, best quality, prompt delivery of

**CLOVE OIL (Pharma Grade)**
**CINNAMON OIL (Pharma Grade)**
**ANETHI OIL (Pharma Grade)**
**CASSIA OIL (Pharma Grade)**
**AJOWAN OIL (Pharma Grade)**
**ORANGE OIL (Pharma Grade)**
**CINNAMON LEAF OIL (Pharma Grade)**
**ALMOND OIL (Pharma Grade)**
**LEMON OIL (Pharma Grade)**

Please Contact Manufacturers:

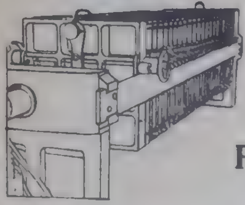
**CHEMICAL PROCESS CONSULTANTS**

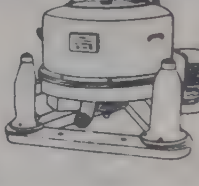
Unit 202, Adarsh Ind. Estate, Sahar Road, Chakala, Andheri (East), BOMBAY 400 099.
Tel: 6325855 Gram: KEMIPROSS

**FILTERCLOTH! FILTERCLOTH!**

*India,s Multinational National and Leading Manufacturers Prefer Filter Clot*
*From:-*

**POPAT BROTHERS**





For CHEMICALS, CEMENT, CERAMIC, DYES, OIL,
RUBBER, PAPER, SUGAR, and other Industries
in Cotton, Synthetic, Nylon, Polyester (Terylene) Polypropylene, and others,

We also offer Centrifuge/Nutch Bags, Filter press Pieces as per your requirement

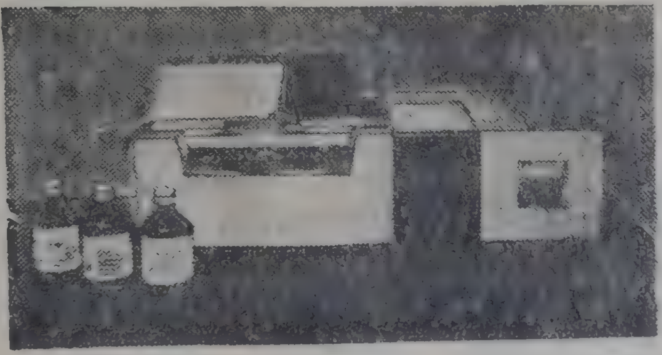
For detailed Information write to:

**POPAT BROTHERS**

249, YUSUF MEHERALI ROAD, P.B. BOX NO. 13074
OLD MASJID BUNDER ROAD, BOMBAY: 400 003 (INDIA)
TELEX: NO. 011-75622 DHCO IN GRAM: POPBROS TEL: 327101 / 343957

The lowest %, the highest marks !

**Lowest % absorption gives RANBAXY'S Solvents for Spectroscopy highest marks for accuracy!**



Ranbaxy's solvents for spectroscopy give minimum absorbance at specified wavelengths leading to optimum accuracy. Currently available is the following range of solvents:

- ACETONE
- BENZENE
- CARBON TETRACHLORIDE
- CHLOROFORM
- DICHLOROMETHANE
- ETHYL ACETATE
- METHANOL
- iso-PROPANOL

*For your requirements, please contact :*

RANBAXY
LABORATORIES LIMITED

**CHEMICAL DIVISION MARKETING OFFICE**
16, MARINA ARCADE, CONNAUGHT CIRCUS
NEW DELHI - 110 001
Phones : 323738, 323739; Telex : 031 4220
Cable : RANBAXYLAB CONNAUGHT CIRCUS

Put **RANBAXY** Reliability in your Laboratory!

We offer following Speciality Chemicals
from ready stocks

We offer following
speciality chemicals fr
incoming consingment

WITH MODVAT BENEFIT

1. CARBOPOL 934 & 940 N.F.
(B.F. Goodrich USA)
2. H.P.M.C. 2910 USP/PREMIUM
Methocel E 5, E 15, K 100, E4M
Methocel E 6/Pharmacoat 606
3. EUDRAGIT (Rohm Pham GmbH)
L 100, Rs PM, L 30 D, E 30 D
4. MICROCRYSTALLINE CELLULOSE N.F.
Avicel PH 101 & PH 102 (FMC USS)
5. SODIUM STARCH GLYCOLATE USP
Primojel USP (AVEBE Holland)
6. XANTHAN GUM USP
7. HYDROXY ETHYL CELLULOSE
Natrosol 250 LR / 250 GR
8. ETHYL CELLULOSE N.F./USP
N-10, N-20, N-50

1. H.P.M.C. 2910 USP/PREMI
Methocel E 15 LV / E 50 L
2. VEEGUM N.F., HV, K, F
(Vanderbilt Trade USA)
3. H.P.M.C. Phthalate USP
(Shin Etsu Japan)
4. EUDRAGIT L 100, RL 100
5. AVICEL PH 102 N.F./USP
(FMC Corpn. USA)

Please Contact for your specific requirements

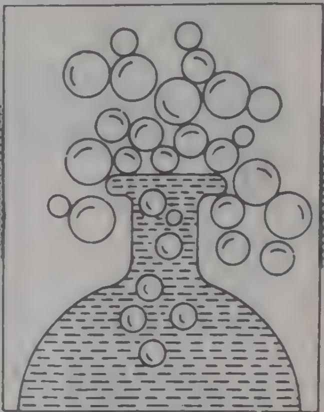
Mr. VIJAY DOSHI
M/s. PIOMA CHEMICALS
11, Bombay Talkies, Malad (West) Bombay 400 064.
Tel: 682 0626. Telex: 011 70076 PCO X IN. Fax: 682 2757 ATTN: VIJAY DOSHI, PIOMA

PCI SILICONES

ATTENTION!
Actual Users/Dealers/Stockists Reduce Your Cost By Using Our Products

PREMOULD-600
SILICONE MOULD RELEASE AGENT
FOR RUBBER INDUSTRIES.

PRESIL-300
SILICONE EMULSION FOR
TEXTILE INDUSTRIES.
& AMINO SILICONES



MULTI
FOAMER N.P.J.
SILICONE DEFOAMER/
ANTI FOAM EMULSION

Please Contact:
PREMIER CHEMICAL INDUSTRIES
Shah & Nahar Industrial Estate, A-1, Gala No. 109, 1st Floor, Near Sun Mill Compound, Lower Parel (W), Bombay - 400 013.
PHONE : 4949771 — 4942176 — 4945869
Branch: 538, Jash Market, Ring Rd., SURAT-395 002. PHONE:40136

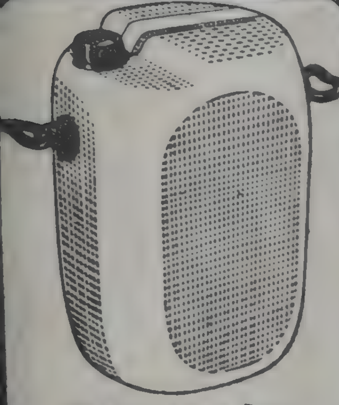
PRINT DES

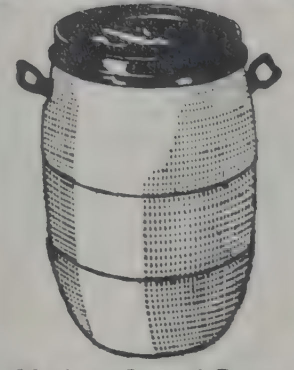
H.D.P. WHITE & BLACK

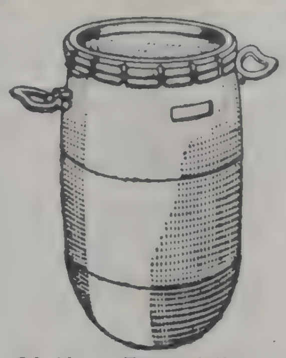
JERRY CANS, CARBOYS & JARS

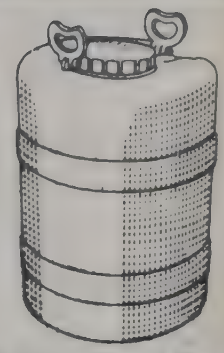
from PIL'S Virgin material

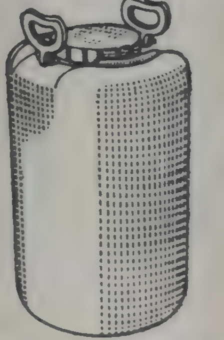
manufactured on IMPORTED Machines

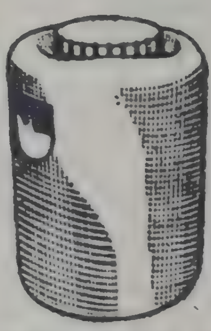

50 Ltrs. Jerry Can

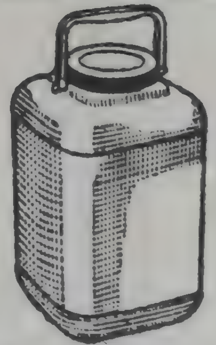

50 Kgs. Round Drum
Full Top Open – 12″ Cap

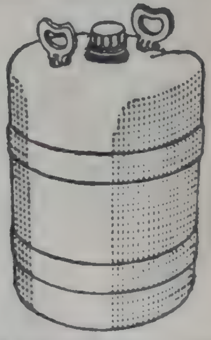

30 Kgs. Round Drum
Full Top Open – 10″ Cap

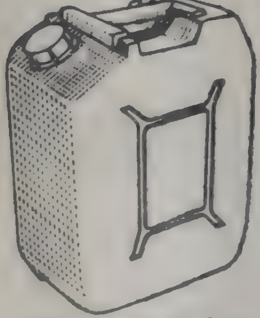

60 Kgs. Round Drum
– 6″ Cap

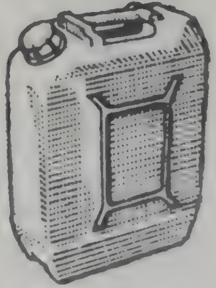

30 Kgs. Round Jar
– 6″ Cap

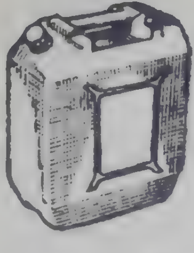

20 Kgs. Round Jar
– 6″ Cap

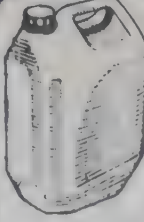

6 Kgs. Square Jar
– 4″ Cap

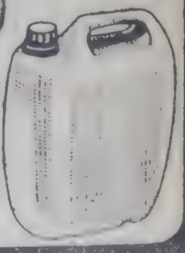

50 Kgs. Round Drum
– 2″ Cap


30 Ltrs. Jerry Can
Stackable


20 Ltrs. Jerry Can
Stackable


10 Ltrs. Jerry Can
Stackable


5 Ltrs.
Jerry Can


6 Ltrs.
Jerry Can

Rajdeep Plastics

FOR YOUR REQUIREMENTS KINDLY CONTACT
17, JAMNADAS INDUSTRIAL ESTATE,
OPP. JAWAHAR TALKIES, DR. R.P. ROAD,
MULUND (W), BOMBAY 400 080.
PHONES: 5613344 • 5616688

ALUMINIUM CHLORIDE ANHYDROU

NO WAITING — ASSURED BEST QUALITY — PROMPT DELIVERIES
NO WAITING PERIOD — ANY QUANTITY — AVAILABLE
FOR LONG TERM CONTRACT

CONTACT LARGEST MANUFACTURERS:

**ARONI CHEMICALS**

(PROP. ARONI COMMERCIAL COMPANY LTD.)

REGD. OFFICE
29, Bank Street, 1st Floor,
Fort, Bombay 400 023.
**Phone: 2862453/2863021**
**Gram: METALDIST**
**Tlx.: 011-6554 MINA IN**

HYDERABAD OFFICE
C/o. I.S.C. Associates,
4-3-82, 1st Floor, Hill Street,
Ghasmandi,
Secunderabad 500 003
**Phone: 70602/825429**

WORKS
Birlagram,
Nagda (M.P.),
PIN. 456 331.
**Phone: 104/283**
**Gram: NIYATI**

ETHANOLAMINES

(Pioneer Manufacturers in India)

MONO-ETHANOLAMINE
DI-ETHANOLAMINE
TRI-ETHANOLAMINE

TRI-ETHANOLAMINE LAURYL SULPHATE
COCO-MONO-ETHANOLAMIDE
COCO-DI-ETHANOLAMIDE
DI-ETHYLENE GLYCOL (DEG)

**P.K. VELU & CO. (PTE) LTD.**

111, Mahatma Gandhi Road, Bombay 400 001.
Tel. 274123 / 5557161 * **Telex: 11-82528 VELU IN**

**If the history of planet Earth can be seen as 1 day, then,**

1) The Human species arrived only 10 minutes ago.
2) Civilization is only 5 seconds old.
3) The Industrial Revolution only 1/8th of a second.
Yet so much has been achieved in 1/8th of a second.

Superchem making the most of 1/7th of 1/8th since we arrived 'only' 30 + years ago;

Process chemicals for the textile industry for Sizing, Desizing,
Scouring, Mercerising, Dyeing, Printing and Finishing.

SUPERCHEM®

**SUPERCHEM®**
132, Dr. Annie Besant Road, Bombay-400 018
Phone: 493 6041, 493 38 18, 493 5482.
Grams: 'Thinogum'. Telex: 75643.

a M.G. Saraf Enterprise
Most trusted name in chemicals.

We Offer Best Quality at Competitive Rates:

- * ZINC DUST (100, 200 & 300 Mesh)
- * ZINC CHLORIDE (Solid & Powder)
- * ZINC OXIDE (Off Grade)
- * ZINC CARBONATE
- * ZINC HYDROXIDE
- * ZINC ASH
- * BRASS ASH
- * ZINC SULPHATE (Tech. & Monohydrate)

Please Contact
**Mr. ABHAY M. SHAH - PROP.**

**SACHIN CHEMICAL CORPORATION**

9, Shree Balkrishna Chambers, 1/4, Issaji Street, 1st Floor, Bombay 400 003.
Phones: Office: 343234, C/o. 322229 Resi.: 8558912, C/o. 8550414 Gram: "ARUNBRO"

Available Regularly at Most Competitive Rates

**PROPYLENE GLYCOL**
(All Grades)
EPICHLOROHYDRINE
ISOPHTHALIC ACID
STYRENE MONOMER

Please Contact:

**KIRAN N. AGRAWAL**

Alankar Building, 3rd Floor, 208, Samuel Street, Bombay 400 003.
**Phone: 335041 to 46**

Ethylene Dichloride 250 Kg. HDPE Drum Packing Formaldehyde 220 kg. HDPE Drum Packing
TRIETHANOLAMINE DIETHANOLAMINE MONOETHANOLAMINE
ETHER PETROLEUM 40-60/60-80/80-100/80-120/90-100/100-120 OLEIC ACID TECH

AMYL ACETATE
BUTYL CELLOSOLVE ACETATE
BUTYL CARBITOL ACETATE
CELLOSOLVE ACETATE
MONOCHLORO BENZENE
TRICHLORO BENZENE
PARA DICHLORO BENZENE

CARBITOL ACETATE
ISOPROPYL ACETATE
METHYL ACETATE
OCTYL ACETATE
ORTHO DICHLORO BENZENE
ISO AMYL ALCOHOL

TRIETHLAMINE
DIETHYLAMINE
MONOETHYLAMINE
MONOISOPROPYLAMINE
DIISOPROPYLAMINE
MONOCYCLOHEXYLAMINE
DICYCLOHEXYLAMINE

For INK / VARNISH / PAINTS Mfgs
MALEIC RESIN (Spirit Soluble / Oil Soluble)
POLY VINYL BUTYRAL (P.V.B.)

QUALITY CSC SOLVENTS

**Chemical Solvent Centre**

43, Princess Street, 3, Devkaran Mansion, 1st Floor, Bombay 400 002.
Office: 314293 * 313812 * 254853 Resi: 8114061 * 6301104
Gram: CHESOLVECE * Telex: Asim 011-73145

*Where Quantity & Quality Matter*
*always Count on....*

KC
KRIPA'S

ACID SLURRY

SODIUM LAURYL SULPHATE
(POWDER, NEEDLES & LIQUID)

SODIUM LAURYL ETHOXY SULPHATE

INDUSTRIAL DETERGENT 40%
HOUSE HOLD DETERGENT POWDER
SPRAY DRIED - 25 Kgs. BULK PACKING

KC
KRIPA'S

KRIPA CHEMICALS PVT. LTD.

**Admn. Office:**
8/9/10 'Royal Chambers',
S. No. 47, Paud Rd., PUNE-411 038.
**Phone: 333245, 331825, 331855**
**Telex: 0145-729 KRIPIN**

**Branch Office:**
House No. 1024, 10th Main Road,
West of Chord Road, IIIrd Stage, 1st Block,
Bangalore-560 079 **Phone: 357393**

PRINT-DESIGN

**Cyclohexanone Cyclohexane**
**Mix. of Cyclohexanol & Cyclohexanone**

MANUFACTURED BY:

**Gujarat State Fertilizers Co. Ltd.**
BARODA

25
CRESCENT
SILVER JUBILEE

Please Contact Authorised Distributors:

**Crescent Chemicals**

**Sales Office:**
56-B, Sanjay Bldg., No. 5, Mittal Estate
Andheri-Kurla Road, Bombay 400 059.
Tel: 6329110/6322136/6300157/6343555
Telex: 011-72284 CRES-IN
Grams:CRESOLVE, Bombay - 400 009

**Branch:**
5-E, Vasant Kutir,
R.C. Dutt Road.
Baroda - 390 005.
Phones: 324313/322279/320128
Grams: CRESCHEM, Baroda 390 005

AVAILABLE EX-STOCK

EXCEL

**DIETHYL OXALATE**
**OXALIC ACID**

PCPL

Phosphoric Acid
Phosphorus Acid
Vanadium Pentoxide
Santobrite/Aluminium Chloride
Thionyl Chloride

Phosphorus White/Red
Ammonium Metavanadate
Phosphorous Pentoxide
Trichloride/Oxychloride

Please Contact:

**ALKA SALES CORPORATION**

Nanabhai Mansion, Sir P.M. Road, Fort, Bombay 400 001.
Tel.: 2864773-2860661-2860390 Grams: BRAJI Telex: 3168 DOSA-IN

ESTABLISHED 1968
NO COMPROMISE ON QUALITY WITH
**BHAVNA'S**

**SILICAGEL**
(Indicating & Non-indicating Type)
Column Chromatography
Thin LAYER Chromatography

MANUFACTURED BY
**Bhavna Chemical Industries**
51, Vithal Udyog Nagar, Vallabhvidhyanagar, Gujarat 388 121.
Tel. No. Fact: 30243 Resi: 30712 Bombay Contact Tel No: 507507
VALLABHVIDHYANAGAR STD CODE NO.: 02692

ADVT/4

*FOR YOUR IMPORT OF:*

**ACID CITRIC BP MONO/FOOD GRADE**
**AROMATIC CHEMICALS**
**DYES INTERMEDIATES**
**GUM ROSIN N/WW GRADE**
**HDPE/LDPE/POLYSTYRENE**
**HYDRAZINE HYDRATE 80%**
**HYDROQUINONE PHOTO GRADE**
**PARANITROCHLOROBENZENE**
**PHARMA INTERMEDIATES**
**THIOUREA**
**TITANIUM DIOXIDE GP B101 etc.**

Please Contact:

**CHEMPHAR**

1610 HANGLUNG CENTRE, 2-20 PATTERSON STREET
HONGKONG

TLX NO. 66986 CEMFA HX
FAX NO. 852-5761637
TEL NO. 852-8950969

FOR YOUR REGULAR REQUIREMENTS AT COMPETITIVE RATE

SODIUM CHLORITE

80% & 50% Also Liquid 25%

Packing - 50 Kgs.

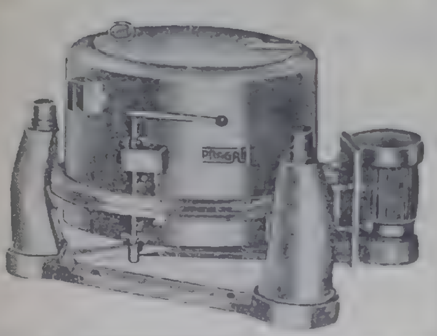
Please Contact

MEHTA BROTHERS

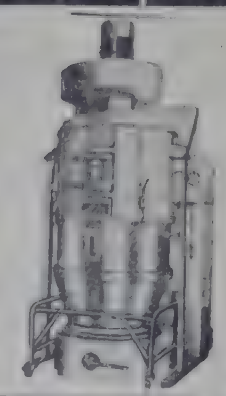
160/162, Samuel Street, 1st Floor, Masjid Bunder, Bombay 400 009.
Phone: 8558881 Resi.: 6140649

PRAGATI the name of quality products.

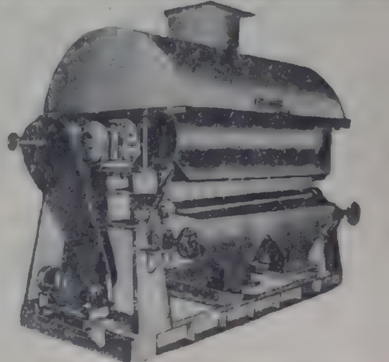
CENTRIFUGES



FLUID BED DRYER



CHEMICAL FLAKER



Manufactured by
PRAGATI ENGINEERING WORKS. Plot No. N-8, Shed No. W-88 (A),
Chikhaloli, MIDC, AMBARNATH-421 501. PHONE: 2961.

For Your Requirements of:

1. Manganese Sulphate Monohydrate
Technical, Feed and Fertilizer Grade
2. Manganese Carbonate
3. Zinc Sulphate
Fertiliser, Feed Grade

Please Contact Manufacturers:

LAKSHMAN CHEMICALS (DAVANGERE)
PRIVATE LIMITED
Post Box No. 233, DAVANGERE - 577 002.
Phone No. Off. 3080; Fact. 3359; Resi: 6359.

*Connected to one of the oldest industries in the world, which incidentally is also the youngest.*

***From ancient garments made of bark and hide, through historical finds of Chinese silk and Egyptian cotton at burial sites, to modern fabrics made on computerized looms, humankind's relations with clothes are as old as civilization. From the time when lamp-black, powdered lapis lazuli, red ochre, dye secretions of the banded murex snail, indigo and other plant, mineral and animal dyes have been used, human facination with colouring agents is also well known.***
***We at Texchem continue this oddyssey, this quest for cloth and its colour.***

***Process chemicals for the textile industry for Sizing, Desizing, Scouring, Mercerising, Dyeing, Printing and Finishing.***

TEXCHEM®

TEXCHEM®

*182, Dr. Annie Besant Road, Bombay-400 018*
*Phone: 493 6041, 493 38 18, 493 5482.*
*Grams: 'Thinogum'. Telex: 75648.*

*a M.G. Saraf Enterprise*
*Most trusted name in chemicals.*

TRADE ENQUIRY SOLICITED IN TANKER LOAD ONLY FOR
FOLLOWING QUALITY PRODUCTS ON LONG TERM AND REGULAR BASIS

**SULPHURIC ACID 98%** COMM. GRADE

**SULPHURIC ACID** BATTERY GRADE (CONCENTRAT

Contact:

**TARAPUR ACID & ALKALI PVT. LTD**

*OFFICE:*
15, Amrit Keshav Nayak Marg, 3rd Floor
Near New Empire Cinema,
Fort, BOMBAY - 400 001
Tel. No. 2046979/2040266/2048850/2044228
Gram: 'YELLOWGOLD'
Telex: 011-84569 GOLD IN

*FACTOR*
Post Box No. 2, Plot No. D-
Tarapur Industrial Area, M.I.D.
Boisar, Dist. THANE - 401 5
Tel. No. 2550/2551/25
Cables: 'CHEMICALS' Bois
Telex: 0132-215 ACID

MANUFACTURERS OF

**SODIUM NAPHTHIONATE**

**ARUN CHEMI-DYES**

**Regd. Office:** Chemical Development Compound,
Manpada, Ghodbunder Road, Thane 400 607.
**Phone: 502220/502726**
**Telex: 1172335 ARUN IN**
**Fax: 91-22-595224, 91-22-5115904**

For Your Requirement Of:

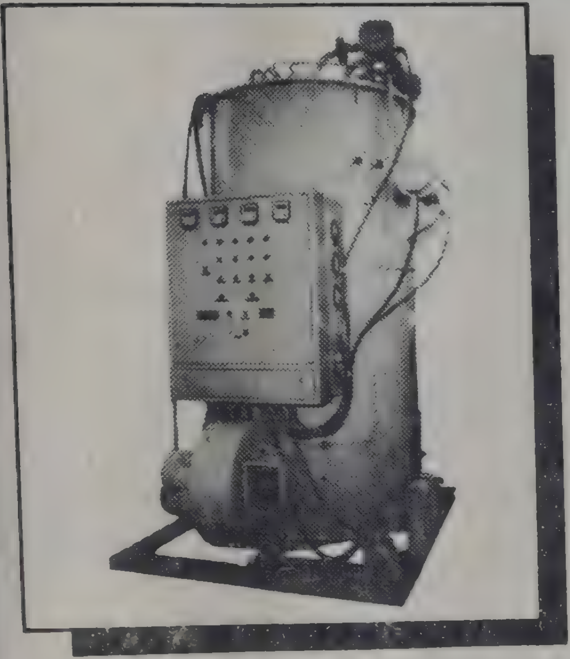
PHENYL HYDRAZINE 99.9% Purity
Phenyl Hydrazine Hydrochloride
Phenyl Hydrazine Sulphate
Diphenyl Carbazide
Diphenyl Carbazone
Dithizone
N-phenyl Anthranilic Acid
Di/Trisodium Hydrogen Phosphate
2,4-Dinitro Phenyl Hydrazine

DIMETHYL GLYOXIME (D.M.G.) 99%
Di Acetyl Monoxime
4-Dimethyl Aminobenzaldehyde
Succinimide
Co Co Diethanolamide
Analin Dihydrochloride
Cetyl Palmitate
Anthrone
P-Dibromobenzene

Contact Manufacturer

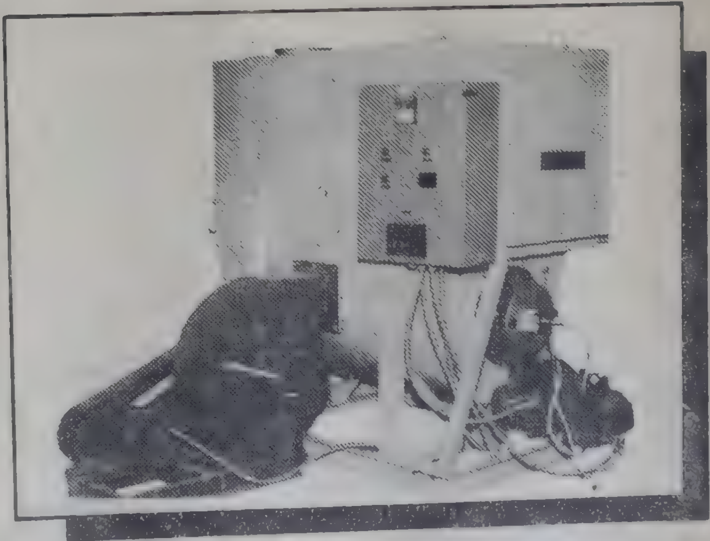
**M/s. HYDRAZINE & HYDRADE MANUFACTURER**
L/13, Kasturi Industrial Estate, Goddeo, Bhayandar (East), Dist. Thane 401 105.
Telephone No. 698 2813

# SLASH DOWN YOUR DRYING COST



## THREE PASS OIL/GAS FIRED AUTOMATIC THERMIC FLUID HEATER

- * RANGE 50,000 TO 10,00,000 Kcal/hr
- * MAX. SUPPLY TEMPERATURE - 300°C
- * COIL FROM SEAMLESS PIPE
- * AUTO/MANUAL OPERATION
- * INDEPENDENT DRIVE FOR FUEL OIL PUMP
- * THERMAL EFFICIENCY 87 ± 2% ON NCV
- * NO CORROSSION OR SCALE FORMATION
- * EASY AND ECONOMICAL OPERATION
- * OUTSIDE PURVIEW OF IBR



## THREE PASS OIL/GAS FIRED INDIRECT AIR HEATER

- *RANGE 60,000 to 6,00,000 Kcal/hr
- *MAX. TEMP : 250°C FOR STANDARD MODEL AND HIGHER TEMPERATURE RANGE WITH SPECIAL CONSTRUCTION.
- *FULLY AUTOMATIC OIL/GAS FIRED HIGH EFFICIENCY BURNER.

For Further details :

**AEROMATIC**
**ENGINEERING COMPANY**
Near Gujarat Bottling, Rakhial, Ahmedabad - 380 023
Phone : 364669
Telex : 0121-6291 AERO IN

**OUR OTHER PRODUCTS**

- PACKAGE STEAM BOILER
- INDUSTRIAL CENTRIFUGAL FANS
- WATER RING VACUUM PUMPS.

Readily Available Alongwith Excise Gate Pass

**POVIDONE IODINE U.S.P** * **DICYCLOMINE HCl**

- TRIMETHOPRIM I.P.
- SULPHAMETHOXAZOLE I.P.
- ETHAMBUTOL HCl I.P.
- ASPIRIN I.P.
- IBUPROFEN I.P.
- PARACETAMOL I.P.
- DIAZEPAM I.P. / ANALGIN I.P.
- ERYTHROMYCIN ESTOLATE I.P.
- ERYTHROMYCIN STEARATE I.P.
- CHLORAMPHENICOL PALMITATE I.P.
- PYRAZINAMIDE
- NIFEDIPINE
- AMOXYCILLIN I.P.
- AMPICILLIN I.P.
- DILOXANIDE FUROATE I.P.
- GUANIDINE NITRATE

PLEASE CONTACT:

**SHILPA TRADING PVT. LTD.**

*Regd. Office:* Rahimtoola House, 7, Homji Street, Bombay 400 001.

**Tel. No.: 2864132/255867 Resi.: 6121334 Cable: 'SHILPADRUG'**

MANGANESE SULPHATE -- 98%

**MONO HYDRATE**

**($Mn\ SO_4 . H_2O$) -- Mn 32%**

MANUFACTURERS

**KUM INDUSTRIES**

1009/2, VINOD BUILDING,
DEEP BUNGALOW CHOWK, PUNE - 411 016

**PHONE: OFFICE: 53129 FACTORY: 84874**

**NOBLE *Packo-Chems***

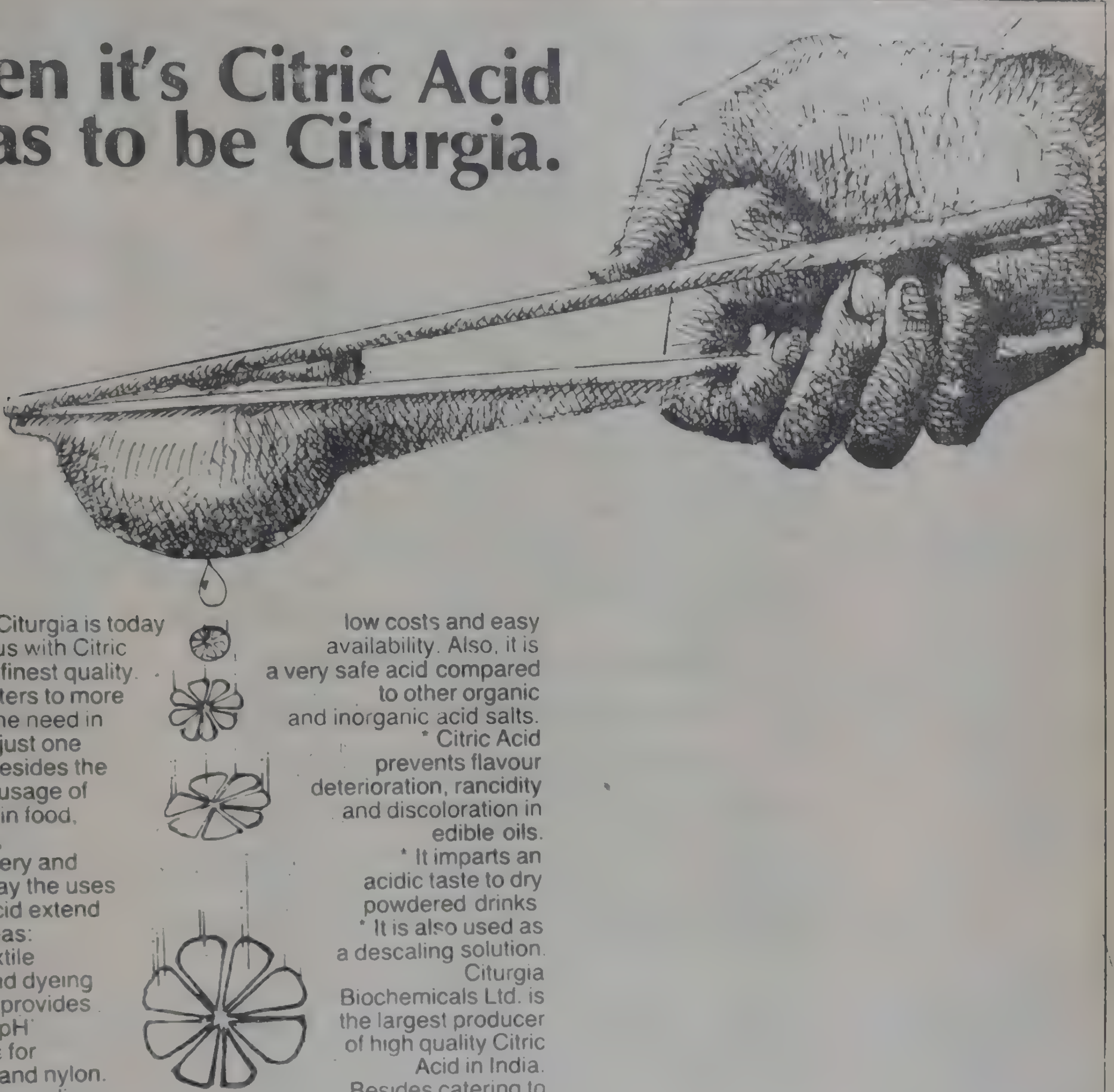
**HEAD OFFICE:**
**17, Venkataroyen Lane,**
**P.B. No. 2315,**
**MADRAS 600 003.**
**Phones: 585840/586553**
**Grams: 'PACKOKEMS'**

SOLVENT OUR BUSINESS

**WORKS:**
**Madhavaram,**
**MADRAS-600 060.**

**ACETONE, ACETIC ACID, BENZENE, BUTANOL, BUTYL ACETATE, BENZYL ALCOHOL, BENZYL ACETATE, CARBITOL, CELLOSOLVE, CHLOROFORM, C.T.C., CYCLO HEXANONE, DIACETONE, D.B.P., D.E.P., D.O.P., D.M.P., D.E.G., ETHYL ACETATE, ETHER PET., FORMALDEHYDE, ISOPROPANOL (I.P.A.), M.E.K., M.I.B.K., M.E.G., PROPYLENE GLYCOL, TOLUENE, TRICHLOROETHYLENE Etc.**

**For all your requirements in any packing**
**contact the PREMIER HOUSE OF SOLVENTS**



# When it's Citric Acid it has to be Citurgia.

The name Citurgia is today synonymous with Citric Acid of the finest quality. Citurgia caters to more than just one need in more than just one industry. Besides the traditional usage of Citric Acid in food, soft drinks, confectionery and drugs, today the uses of Citric Acid extend to new areas:

* In the textile printing and dyeing industry it provides 'STABLE pH' conditions for polyester and nylon. As also for acrylic prints curing and cotton-resist printing. Citric Acid has successfully replaced imported Tartaric Acid because of its excellent quality, low costs and easy availability. Also, it is a very safe acid compared to other organic and inorganic acid salts.

* Citric Acid prevents flavour deterioration, rancidity and discoloration in edible oils.

* It imparts an acidic taste to dry powdered drinks.

* It is also used as a descaling solution.

Citurgia Biochemicals Ltd. is the largest producer of high quality Citric Acid in India. Besides catering to the domestic demand, Citurgia's Citric Acid is exported to USA, Japan, Germany, Australia, Iran, Malaysia, Sri Lanka and other countries.

## Citurgia Citric Acid
## India's No. 1

CITURGIA BIOCHEMICALS LIMITED

Regd. Off : Neville House, J.N. Heredia Marg, Ballard Estate, Bombay 400 038.
Tel.: 2618071 Gms.: CITURGIA BOMBAY.
Tlx : 11-73372 BDM IN

Available Regularly at Competitive Rates Ex-Stock/Ex-Factory

**SODIUM NITRITE * SODIUM NITRATE**

Mfrd. by: M/s. SONIL Div. of M/s. CHEMCROWN (INDIA) LTD.

| | |
|---|---|
| RIFAMPICIN I.P. (COMPACTED) | 2-AMINO-4,6-DICHLORO PHENOL HCL (ACPH) |
| IBUPROFEN I.P. | 2-AMINO-4-CHLORO PHENOL |
| PHENOBARBITONE I.P. | OCTYL ACETATE |

Mfrd. by: M/s. CUREKRAFT CHEMICALS (I) PVT. LTD. Divn. of M/s. CHEMCROWN (I) LTD.

**PARA TERTIARY BUTYL PHENOL -- PTBP**

**DITERTIARY BUTYL PARA CRESOL -- DBPC (BHT)**

Indenting Agent of M/s. Balmer Lawrie & Co.

Please Contact:

**CHEMCROWN INDIA LTD.**

D/3, Poonam Apartments, Dr. A.B. Road, Worli, Bombay 400 018.

Phone: 4928386/4928737 * Telex: 011-71758 CHEM IN

CALCUTTA OFFICE: 295652/290218 * DELHI OFFICE: 3317051/3316666 * KANPUR OFFICE: 211641/211825 * MIRZAPUR OFFICE: 358

**CREAM OF TARTAR LR/AR**

(Potassium Bi-Tartarate)

**ANTIMONY POTASSIUM TARTARATE LR/AR**

**ROCHALLE SALT**

(Potassium Sodium Tartarate)

**SODIUM TARTARATE LR/AR**

**TARTARIC ACID (99 & 99.5%)**

Please Contact:

**NATIONAL CHEMICAL INDUSTRIES**

*Factory:* Plot No. W-43, M.I.D.C. Industrial Estate, Morivli, Ambernath, Maharashtra 421 501

*Office:* 12, Bharat Mahal, 3rd Floor, Thane (East), Maharashtra 400 603. Phone: 507267/594898

AVAILABLE REGULARLY

ALUMINIUM STEARATE * ZINC STEARATE * LEAD STEARATE

T.B.L.S. D.B.L.S.

C.P.W., D.O.P., TOLUENE, ORTHOXYLENE, MEK, PROPYLENE GLYCOL/DOW/ARCO/JAPAN, I.P.A., MIX. XYLENE, ACETONE, GILSONITE, P.G. RED OXIDE, SOYALECITHIN, CARBON BLACK, DEG REFILE, 2B WHITENER, COTTON, SYNTHETIC PLASTIC WHITENER FOR LD/HD/PP/PVC/ACRYLICS. VERGINE, TITANIUM DIOXIDE, PHOSPHORIC ACID 85%, JSR RUBBER, KEMLOP, A. WAX, 4202 JAPAN, E 114, STEARIC ACID.

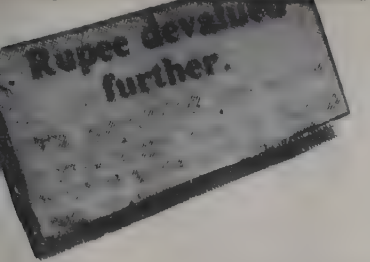
Contact:

**UNIQUE ENTERPRISES**

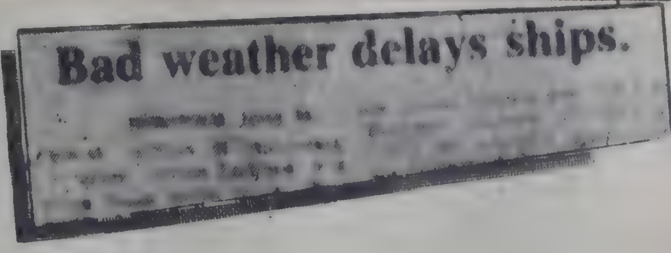
503, Bharuch Sadan, Iron Market, Devji Ratanshi Marg, Bombay 400 009.

Telephone: Office: 331475/344445 Residence: 6062955

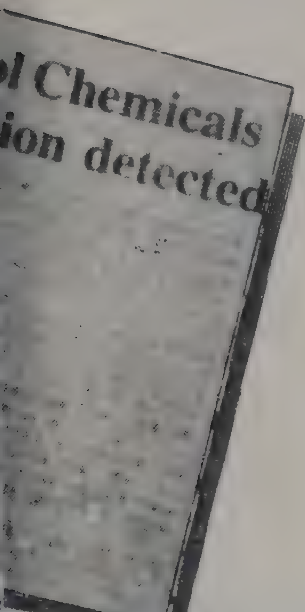
REGULAR REQUIREMENT COPPER WASTE IN ANY FORM OXIDE/DUST/ASH. WE REQUIRE CHEMIST IN RUBBER ADHESIVE



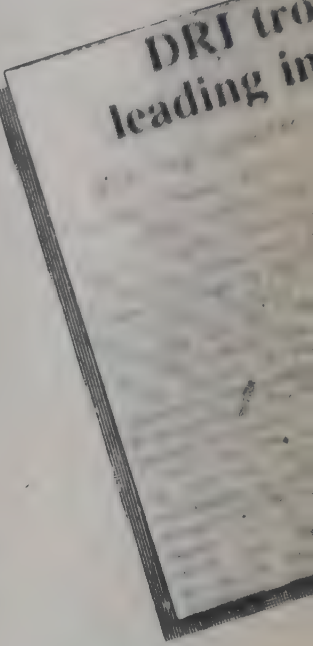
Rupee devalues further.



Bad weather delays ships.



l Chemicals
ion detected



DRI tro
leading in

# POLYVINYL ALCOHOL IS NOW CALLED POLYNOL*

## AND POLYNOL* BUYERS NEVER HAVE TO WORRY ABOUT:

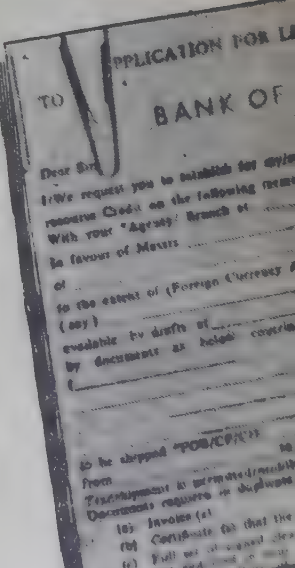
- Import procedures.
- Foreign Exchange fluctuations.
- Opening LC's and chasing up on bank formalities.
- High inventory costs due to uneconomical container load imports in excess of requirement..
- Port strikes and delayed supplies.
- Absence of technical back-up services.
- DRI trouble caused by/due to illegal importation methods.

POLYNOL* is available in both hot and cold water-soluble grades, comprising of SIX different grades of varying viscosities and hydrolysis. The range is designed to cover almost every requirement of the Indian Industry.

An extensive dealer network on an All-India basis ensures prompt ex-stock availability.

POLYNOL* comes to you backed by the POLYCHEM mark of ASSURED QUALITY, and a guarantee of prompt, skilled back-up service.

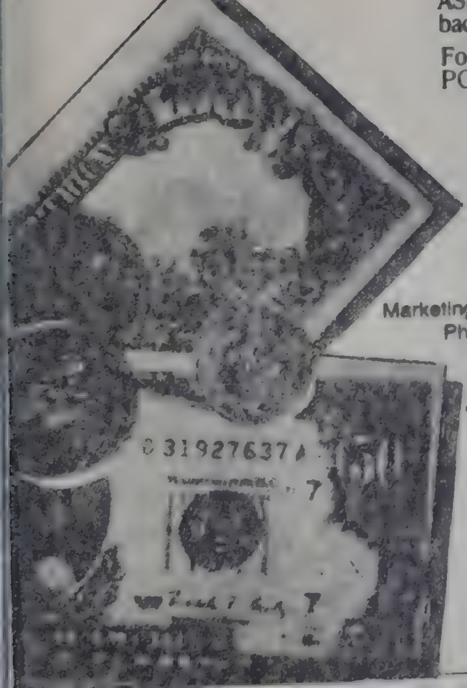
For trade inquiries and further information on POLYNOL*, contact:



PPLICATION FOR L

TO

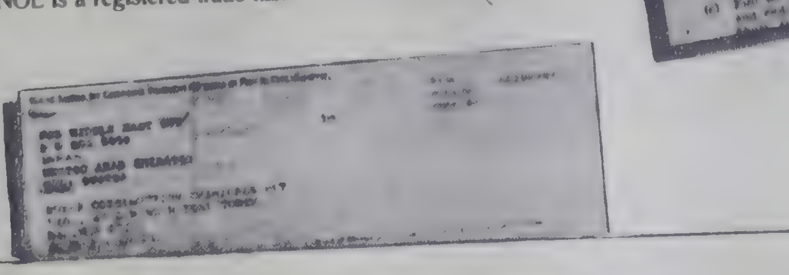
BANK OF



## POLYCHEM LIMITED

Marketing Division, 309/310, Raheja Centre, Nariman Point, Bombay-400 021.
Ph.. 221991/221370 Telex: 011-2203 KDCO IN 011-3434 ICC IN
Grams: Polychemic Fax: 022-2041432.

* POLYNOL is a registered trade name of POLYCHEM LTD.



FOR YOUR REQUIREMENTS OF

**HYFLOSUPERCELL - U.S.A.**
**THIOUREA**
**DICYANDIAMIDE (D.C.D.A.)**
**DIMETHYLAMINE (RCF)**

Please Contact

**JAYDIP AGENCIES**

2-B, Ganga Vihar, 94, Kazi Sayed Street, Bombay 400 003.
**Phones: Office: 343316/331357 1.00 to 7.30 P.M. Resi.: 6366280 8.00 A.M. to 12.00 Noon**
**Fax: 00-91-22-325620 (JA) Gram: "JAYDIPIMPO" Bombay 56**

**M.D.I. (Diphenyl Methane Di Isocyanate PAPI-27) (DOW, U.S.A.)**

HYDROXY ETHYL CELLULOSE (LR/GR) * H.P.M.C. ALL GRADE
SYNTHETIC ACRYLIC RESIN 50% (I.C.I. U.K.) (For Paint or Ink)
FORMOSUL (U.K.) (Against Rangolite-DS) (Imported)
BETA NAPHTHALENE SULPHONIC ACID (HICO)
UVTEX (Optical Whitening Agent for Plastic Industries) (Imported)
PARA NITRO ACETOPHENONE * METHYL CELLULOSE ALL GRADE
EPOXY PLASTICIZER (Imported) * P.V.C. (Additives)

Please Contact:

**AMRIT CHEM**

404, Guru Krupa, 133, Kazi Sayed Street, Bombay 400 003.
**Phone: Office: 325233, 341444; Resi.: 6121976, 6150823 * Telex: 011-73130 SWAMI IN**

For Your Requirements of:

**NITRO BENZENE**

**as per I.S.I. Specification**
**in Bulk (Tanker Load) and Drum Packing**

*Manufactured by*

**M/s. ABHINISHA INTERMEDIATES (P) LTD.**

*Office:* Narotam Building, Kapasia Bazar, Kalupur, Ahmedabad 380 002.
**Phone: (O) 339668 (R) 468772**
*Works:* Plot No. 1469/1, Near Atlas Organics (P) Ltd., Opp. M. Ravji & Co., Rajpur, Tal. Kadi, Dist. Mehsana.

# TECHNICAL KNOW-HOW

## AVAILABLE FOR

1. AMPICILLIN TRIHYDRATE
2. RIFAMPICIN
3. ERYTHROMYCIN STEARATE
4. ERYTHROMYCIN ESTEOLATE
5. TINIDAZOLE
6. TARTARIC ACID
7. CREAM OF TARTAR

*** CONSULTANCY ON PROCESS OR TURN-KEY PROJECTS UNDERTAKEN**

*** TROUBLE SHOOTING FOR ANY ORGANIC CHEMICALS AVAILABLE**

*CONTACT:-* MILAN KUMAR
**ATLANTIC PHARMACEUTICALS (P) LTD.**
C-17-A, 144, ASHOK MILL COMPOUND,
SION BANDRA LINK ROAD,
BOMBAY 400 017.
PHONE : 409 0694

FOR YOUR REQUIREMENTS OF

*** PARA TOLUENE SULPHONYL CHLORIDE**
*** PARA TOLUENE SULPHONAMIDE**
*** PARA TOLUENE SULPHONYL UREA**
*** PARA TOLUENE SULPHONIC ACID**
*** PARA CHLOROBENZENE SULPHONAMIDE**
*** PARA CHLOROBENZENE SULPHONYL UREA**
*** RANSOLITE (SULPHONAMIDE RESIN)**

Please Contact:

**MANUFACTURER:**
**M/s. USHMA INDUSTRIES**
124/36A, G.I.D.C.
Nandesari 391 340, Dist. Baroda,
Gujarat State
**Phones: 320761, 320645**
**Resi: 21396, 22194.**
**Fax: 0265-320929. Telex: 0175-401 HEMA IN.**

**BOMBAY DEALER:**
**PARUL TRADING CO.**
Room No. 10, 1st Floor,
310-314, Samuel Street
Bombay - 400 003.
**Phones: 337738, 327105**
Office Time: 1.00 p.m. to 6.00 p.m.

CALCUTTA OFFICE:
MR. GAUTAM B. PATEL,
**RECKON REMEDIES**
28/3A, Convent Road, 4th Floor, Calcutta 700 014. Phone: 249587; Resi: 469164

For Pharmaceutical Industries

PETROLEUM BENZINE (PETROLEUM ETHER) 40°-60°/60°-80°/60°-95°

HEXANE 65°-70° EMULSIFYING WAX

* *

For Paint/Pesticide/Agro/Rubber Industries

PETROLEUM BENZINE (PETROLEUM ETHER) 80°-100°/80°-120°/90°-100°/100°-120

* *

AMYL BUTYRATE ETHYL BUTYRATE BUTYL BUTYRATE

SCHAEFFER'S ACID (AS SODIUM SALT) (Export Enquiries Solicited)

Contact Manufacturers

STERLING ORGO & INORGO CHEMICALS P. LTD.

**Regd. Office:** 340/42, Samuel Street, Raut Chamber, 4th Floor, Bombay 400 003.
**Phones:** 333601/333602/338722 **Telex:** ASIM IN 73145 **Fax:** 331738
**Factory:** Plot AF-1, Cama Industrial Estate, Walbhat Road, Goregaon (East), Bombay 400 063.
**Phone:** 6730458/6734593/6734650 **Resi.:** 352625/364354/8114061

AVAILABLE IN BULK QUANTITY AND READY STOCKS

POLYNOL -205
(against Unitika UP-050-G)
For 'O' Filament Sizing Yarn
POLYNOL - 117
(against PVA-173 & BF-17)
POLYNOL-217
POLYNOL-224
(against GH-17 & BP-20)
VINYL ACETATE MONOMER
STYRENE MONOMER
AUTHORISED DISTRIBUTOR
FOR POLYCHEM LTD.

CHECK OUR OFFER BEFORE YOU BUY

MANSI POLYCHEM PVT. LTD.

B/1 MILIND PARK,
OPP. ST. XAVIER'S HIGH SCHOOL
BUS STOP, MEMNAGAR ROAD
AHMEDABAD-380 052. (INDIA)
PH : 465100/490064

TLX 121 6196 MPC IN
GRAM - POLYNOL

For Your Requirements of:

- * BENZENE
- * TOLUENE
- * XYLENE (Ortho/Mix)
- * D.E.G.
- * M.E.G.
- * SOLVENT CIX
- * ACETONITRILE
- * ACRYLONITRILE
- * BUTYL ACRYLATE
- * METHYL ACRYLATE
- * ETHYL ACRYLATE
- * STYRENE MONOMER
- REACTIVE/DIRECT DYES
- * BINDER (Textile/Leather)
- * PIGMENT EMULSIONS
- * TEXTILE OILS (Antistatic-Coning/Warping etc.)
- * CATIONIC SOFTENERS
- * ACRYLIC SIZE

Please write to:

PARIMAL TEXTILE WORKS

48, Gokhale Road (South), Dadar, Bombay 400 028.
**Phone: 4225276**

Available at Most Competitive Rates
from

a Trusted Name Since Two Decades

**NITRIC ACID**

**58%, 72% and 98%**

**in Tanker Loads Delivered All Over India**

**Chemicals & Allied Industries**

**(Authorised Dealer of R.C.F. Ltd.)**

215, Bezzola Complex, Sion-Trombay Road, Chembur, Bombay 400 071

**Phones: 529693/523385**
**Gram: NITRICHEMI**

Ahura

**SPELLS QUALITY**
**SELLS QUALITY**

82, MAHAKALI ROAD, ANDHERI (EAST), BOMBAY 400 093.

AVAILABLE FOR EXPORTERS AND DOMESTIC CONSUMERS

**SODIUM BI SULPHITE** Tech/Photo/Pure
**SODIUM META BISULPHITE** Tech/Photo/Pure
**SODIUM SULPHITE** Tech/Photo/Pure
**SODIUM CARBONATE MONO HYDRATE** Tech/Photo/Pure
**AMMONIUM THIO SULPHATE 60% SOLUTION**

Contact Manufacturer

**MEHTA SULFITES (IND) PVT. LTD.**

215/216, Swastik Chambers, Sion Trombay Road, Chembur, Bombay 400 071.
Telex: 011 72334 GROW IN Tel.: 528283/4/5 Gram: SULFINDIA, P.B. No. 17222.

FOR YOUR REGULAR REQUIREMENT OF:

**ACETYL CHLORIDE** **CHLOROACETYL CHLORIDE**
**BENZOYL CHLORIDE** **BENZOTRICHLORIDE**
**BENZOYL PEROXIDE** **BENZYL CHLORIDE**
**BENZOIC ACID**

Please Contact Manufacturers:

**Shree**
**ORGANIC CHEMICALS**

184, Samuel Street, 21 'A' Mandvi Chambers, 2nd Floor, Bombay 400 003.
Phone: Off: 345418 / 332659
Phone: Plant: LOTE. 256

FOR YOUR REQUIREMENTS OF

**HEXACHLOROETHANE**
**METHYL ANTHRANILATE**
**ISATOIC ANHYDRIDE**

Please Contact:

*Manufacturer:* **ANSHUL CHEMICALS PVT. LTD.**

Excel Estate, S.V. Road, Goregaon (W), Bombay 400 062.
Telephone: 6724091

# REASONABLE PRICES AND EX-STOCKS

**EDTA ACID 99 ± 1%**

**LIQUID EDTA (50 C.V. & 100 C.V.)**

**DTPA 99 ± 1%**

**DTPA SOLUTION 40%**

**NITRILO TRI ACETIC ACID (N.T.A.)**

CONTACT
MANUFACTURER

**OM NEELKANTH
CHEMICALS INDIA PVT. LTD.**
FACTORY :
S. NO. 204, KARANNAGAR - 382 727
DIST. MEHSANA (N.G.) PHONE : 2129
(KADI - DIRECT DIAL CODE 02769)

OM NEELKANTH
CHEMICALS

OUR NEW HEAD OFFICE ADDRESS :

5, ANAND CHAMBERS, 2ND FLOOR,
NEAR STATE BANK OF INDIA, OPP. "SHILP",
NAVRANGPURA, AHMEDABAD - 380 009.
PHONE : 408360 GRAM : NEELCHEM
TELEX : 121-6539 TRCE IN
ATTN : OM NEELKANTH

---

# DIAM ORGANIC CHEMICAL INDUSTRIES (P) LTD.

*Offers*

# GLYCOL ETHERS

CELLOSOLVES, CARBITOLS
TRIGLYCOL ETHERS
&

# TRI-ETHANOLAMINES

Contact:

*Bombay Office:* Crescent Chambers, First Floor, Tamarind Street, Fort, Bombay 400 023
**Tel: 272341, 276239, 272339**
**Tlx: 011-85644 TAPS IN**
Cable: 'CHERRY', Bombay 400 036.

FOR YOUR REGULAR REQUIREMENTS OF:

**HYDROGEN PEROXIDE 50%**

Manufactured by: M/s. NATIONAL PEROXIDE LTD.

Contact Authorised Stockist

**V.K. ENTERPRISE**

233/35, Samuel Street, 18, Bhatia Nivas, Vadgadi, Bombay 400 003.
Phones: Office: 341938/348124 Resi.: 6363983

ATTENTION PLEASE: F.R.P. MOULDERS, FABRICATORS AND LINERS

For all your needs in

**POLYESTER RESINS**

Please Contact:

**PLIOGRIP RESINS & CHEMICALS PVT. LTD.**

One of the leading manufacturers of:

G.P. - ISO. Boat Grade, GALCOATS, Fire Retardant, Lamination & Automobile Grades

*Works:*
W/78, Phase II,
Opp. H.M.V., M.I.D.C.,
Dombivli (E), Dist. Thane,
Phone: 5682

*Office:*
96, Narayan Dhuru Street,
2nd Floor,
Bombay 400 003
Phones: 333655 & 346984

*Sales & Enquiries:*
CONTACT OFFICE
or
PHONES
Res. 6340986, 4092960, 4078280

We Offer Best Quality at Competitive Rates:

**ACID SLURRY - SOFT/HARD**

MANUFACTURERS:

**Gala Chemicals**

*Admn. Office:*
C/34, Adke Compound, Surya Nagar Road, Vikhroli (W),
Bombay 400 083.
Tel. No. 583276, 587361

**ROHAN DYES AND INTERMEDIATES**
**(AHMEDABAD)**
**FOR YOUR REQUIREMENTS AS PER INTERNATIONAL STANDARD TOP IN QUALITY**

- GAMMA ACID
- G. SALT
- R. SALT
- META UREIDO ANILINE HCL
- K. ACID
- AMIDO G. SALT
- S.P.C.P.
- S.P.M.P.
- 2.5 DICHLORO S.P.M. P.
- P.M P.
- SULFANILIC ACID (TECH. GRADE)
- SULFANILIC ACID (PURIFIED)
- SCHAFFER'S ACID
- 4-NAP
- 4-NAPSA

AND SHORTLY INTRODUCING. MANY NEW ITEMS & A RANGE OF DIRECT. ACID AND REACTIVE DYES

**ROHAN DYES & INTERMEDIATES**

**OFFICE :**
189, NEW CLOTH MARKET,
AHMEDABAD-380002.
PH. : 368171 & 360758, FAX : 272-346412
TELEX : 1216942 JITM IN.

**BOMBAY OFFICE :**
2ND FLOOR, PUSHPAWATI BLDG. NO. 2,
CHANDANWADI, GIRGAON ROAD,
BOMBAY-400002.
TEL. 256740 , 298224 TLX : 01182383

**FACTORY :**
115, GIDC, PHASE I, VATVA,
AHMEDABAD-380045.
PH. : 831131-2, 833771 & 834469

**DISTRIBUTOR :**
RONAK ENTERPRISES
B/2, RAJDEEP PARK FLATS,
BALIAKAKA RD., AHMEDABAD.
TEL. : 396719 & 395475.

---

ATTENTION MANUFACTURERS OF DYESTUFFS, DYE INTERMEDIATES, BULK DRUGS AND BULK DRUG INTERMEDIATES

Regularly Available on Competitive terms

**ACETANILIDE OF ULTRA PURE QUALITY**

INTRODUCING SHORTLY

ANILINE OIL
N,METHYL.N,HYDROXY ETHYL ANILINE
OXYETHYL NITRO ANILINE
N,N,DIHYDROXY ETHYL META TOLUDENE
N,ETHYL-N-HYDROXY ETHYL ANILINE
N,N,DIHYDROXY ETHYL ANILINE
N,N,DIHYDROXY ETHYL META CHLORO ANILINE

Contact Manufacturers .

**VASUDHA CHEMICALS PVT. LTD.**

501, Sai Ashish A-Wing, Balrajeshwar Road, Mulund (W), Bombay 400 080
Tel: 5604382/5613921 Fax: 91-22-5603680 Tlx: 011-71030 DELI IN

GANESH MEDICAMENT PRIVATE LTD.
manufacturers of
**PHENOBARBITONE I.P.**
**PHENOBARBITONE SODIUM I.P.**
FOR BEST QUALITY AT MOST ECONOMICAL RATES
AVAILABLE FROM READY STOCK

**GANESH SYNTHETICS & CHEMICALS**
MANUFACTURERS OF
SODIUM BENZOATE I.P.
BENZOIC ACID I.P.
BENZOATE PLASTICIZER

For Further information please contact:
H.O.
145-A, Dr. Veigas Street, Kalbadevi Road, Bombay-400 002
Telegram: 'BENZACID' Telex: 011-3906 GNES IN Phones: 317993 . 298476 . 253438 Fax: 2863768

Delhi Office: 9, Dewan Hall, 3rd Floor, Bhagirath Palace, Chandni Chowk,
DELHI - 110 006. Phone: 2915309
Calcutta Office: 4, Synagogue Street, 9th Floor, CALCUTTA - 700 001.
Phone: 250790. Gram: 'GLOBALCHEM'

PRINT-DESIGN

# Chemical Weekly

VOL. XXXV JULY 31, 1990 NO. 47

*Publishers:*
**SEVAK PUBLICATIONS**

*Editor - Publisher*
**R. RAGHAVAN**

*Advertisement Manager*
**N.R. RAJAGOPALAN**

*Administration/Circulation*
**VIJAY RAGHAVAN**

*Editorial & Administrative Office:*
306, Shri Hanuman Industrial Estate
G.D. Ambekar Road, Wadala,
BOMBAY 400 031.
Phones: 4120743/4131198.
Telex: 011-76053 CWLY IN

*Madras Office:*
Room No. 9, Wellingdon Estate,
3rd Floor, 24, Commander-in-Chief
Road, Madras 600 105.
Phone: C/o. 471659.
Telex: 041-6290 CWLY IN.

*Printed at:*
Sevak Publications,
25, North Mada St., Thiruvanmiyur,
Madras 600 041.

Fast Print Service,
307/308, Shri Hanuman Indl. Estate,
G.D. Ambekar Road, Wadala,
Bombay 400 031.

**Subscription Rates:**
**(Inclusive of Postage)**
India: Rs. 400.00
Foreign: US$ 175.00 (Air Mail)
US$ 75.00 (Sea Mail)

***Subscription charges payable in advance in favour of SEVAK PUBLICATIONS***

## CONTENTS

Heralding the 21st Century: Energy scene — The role of geothermal energy — T.P.S. RAJAN 41
Chemarena — S.L. VENKITESWARAN 43

### IN THE NEWS

Chemplast to modernise, expand PVC production 46
Chavaran titanium factory: No decision yet on Tata's takeover 48
CCS on industrial alcohol off 52
2nd Acharya P.C. Ray memorial lecture: Importance of oleo chemical industry stressed 67

### PHARMACEUTICAL CAPSULE

Rs. 66.35 crore fine on Glaxo 49
Excessive controls will hit drug production and distribution 50
IDPL Muzaffar unit to be closed? 53
Drug industry threatens two day stir 54
MBL to set up bulk drug project 55
Alfa drug project for intermediates 56

### FERTILISER AND PESTICIDE BRIEFINGS

Technical grade pesticides: Plea for price monitoring 65
Formulators opposed to changes in pesticides act 66
Karnataka yet to decide on MCF takeover 66

### OIL AND NATURAL GAS SCENARIO

Propylene, catalytic reformer unit at Mathura: IOC gets eco clearance 68
Cabinet sends proposal back to finance ministry: Kandla-Bhatinda pipeline delayed further 69
Gas cracker commissioned 70
Experts find fault with WB gas report 74
ONGC to go for RABMN 74
Gujarat units to fight ONGC 76
Chamber rejects report on natural gas price 78
Kathalguri, Amguri power projects: Centre proposes gas linkage 79

### ENVIRONMENT NEWS

Tehri project okayed 81
Gas and coal based power plants: Environment ministry clears most projects 81

### MINERALS AND METALLURGICAL FRONT

Lower excise duty on aluminium products mooted 82
Govt. not to supply power: Pvt. sector mini steel plants allowed 84

### REGULAR FEATURES

Highlights in Chemical Technology 89
New Products 93
Indian Standards 97

### SPECIAL ARTICLES

A New Branch of Primary Plasticisers — D.Y. SUKHTANKAR 101
Promotion of Export Culture in Indian Chem. Industries — N.S. VENKATRAMAN 103

### SUPPLEMENT ON LEATHER PROCESSING

Speciality Phosphorylated Fatty Derivatives as Prospective Leather Lubricants — K. VIJAYALAKSHMI, GEETA BASKAR, V.V.M. RAO and S. RAJADURAI 105
International Leather Scenario 109
Leather Abstracts 110
Indian Leather Scene 111

### INTERNATIONAL SPECTRUM

Chemical News from Abroad 115
Chemical Markets Abroad 119
Biotechnology 121
Environment 123

### MARKET INFORMATION

Bombay Chemicals Market 125
Bombay Dyes Market 130
Delhi Market 132
Madras Market 133
Shipping News 134
Materials Imported/Exported 137

**Acetic Acid**
**Acetic Anhydride**
**Chloro Sulphonic Acid**
**Aspirin IP**
**Salicylic Acid IP**
**Caustic Soda Flakes**
**Caustic Potash Flakes**
**Hydrazine Hydrate all grades**
**Magnesium Hydroxide N.F.**
**Magnesium Trisilicate IP**

श्री SHREE ENTERPRISES
(CHEMICALS) PVT. LTD.

A Shree Group

801, Dalamal Towers, 211, Nariman Point, BOMBAY-400 021.
PHONES: 231336 □ 231308 GRAM: "ANHYDRIDE" TELEX: 011-5179

CHEMICAL
WEEKLY

VOL. XXXV JULY 31, 1990 NO. 47

## HERALDING THE 21st CENTURY - 61

# Energy Scene — The role of Geothermal Energy

The earth's crust contains enormous amounts of energy which is referred to as geo-thermal energy. Geo-thermal energy is derived om the heat caused by the natural decay of radioactive elements within e earth's crust.

Where molten rock and magma have found their way to the surface, ese instrusions either cool down and solidify or occasionally explode the form of volcanoes. The magma, of course cannot be tapped irectly. But when cracks in the rock allow water embedded in the rock act as a conductor of heat giving rise to hot springs, geysers, fumrols, it is possible to tap this energy.

The average rise in temperature drilling into the earth is about 30°C per kilometer. This means that on an average a temperature of 90°C can be expected at a depth of three kilometers, a depth common in oil drilling and a temperature sufficient for both space heating in cold countries and a variety of heating processes in industry and agriculture. Both Paris and Beijing are fortunate in having permeable rock formations at suitable depths to allow the earth's inner energy to be tapped at relatively low cost. As a supplier of heat, it is second only to another natural resource, solar energy. And like solar energy it is widely distributed over the earth's surface, but can be released only in amounts too small for it to be directly converted into electricity. The immenseness of the geothermal energy of the earth cannot be properly defined. The heat of the rocks of the earth above the depth of 10 KM has been estimated to be 3 x $10^{26}$ calories. However, only a fraction of this heat is available as a resource recoverable to be utilised. 0.03 per cent or $10^{23}$ calories of the above energy total is considered hot enough and near enough to the earth's surface to be recoverable, the rest of the energy seems to be too dispersed throughout the crust.

At a depth of 6 miles, the temperature of the earth is greater than 100°C. Thus the total geothermal energy in storage far exceeds, by several orders of magnitude, the total thermal energy available in all the nuclear and fossil fuel resources on this planet There are three types of resources for geothermal energy: steam, hot water and hot rock. The steam resources can be subdivided into two types, dry steam or wet steam which is sometimes referred to as vapour dominated steam. The dry steam resource is the most desirable, in that with little pretreatment to remove corrosive materials, it can be directly piped to a turbine to produce electricity.

The table below gives investment necessary for the four electricity sources; geothermal, nuclear, hydropower and coal. Coal and oil plant costs are comparable since usually a fossil fuel plant is built for the eventual possibility of changing from one fuel to another.

**COST COMPARISON OF FOUR ELECTRICITY SOURCES**
(1980 prices)

| | Geo-thermal $ | Nuc-clear* $ | Hydro power $ | Coal* $ |
|---|---|---|---|---|
| Plant investment $/KW | 110.00 | 225.00 | 250.00 | 150.00 |
| Fixed charges 14%/yr/KW | 15.40 | 31.50 | 35.00 | 21.00 |
| Fixed charges mills/KWHR | 1.95 | 4.00 | 6.10 | 4.36 |
| Operating costs, mills/KWHR | .25 | .50 | .10 | .25 |
| Energy costs, mills/KWHR | 2.66 | 2.00 | -- | 3.00 |
| **Total Costs:** | | | | |
| Variable load factor, mills/KWHR | 4.86 | 6.50 | 6.20 | 7.61 |
| 90% load factor, mills/KWHR | 4.86 | 6.50 | 4.55 | 5.92 |

* Costs have risen disproportionately due to fuel crisis, and safety and environmental regulations.

**Where is the energy being used.** Installations in seven countries now make commercial use of geothermal energy. The worldwide totals for electricity presently generated from geothermal energy would supply the needs of a typical U.S. city of 1,000,000 while the totals for direct thermal use are sufficient to supply the space heating needs for Chicago's 3,000,000 people. The U.S. now generates 500 megawatts (MW) of electricity to lead the world in this use of geothermal energy. Italy (420 MW) and New Zealand (200 MW) are not far behind. Much smaller amounts of electricity are derived from geothermal energy in Mexico, Japan, El Salvador and Iceland. The U.S.S.R. and Hungary utilize geothermal energy for direct heat use to an extent 13 times greater than does the rest of the entire world. The Geysers Geothermal Development north of San Francisco (near Santa Rosa) is operated jointly by Pacific Gas and Electric, Union Oil and other resource development companies. The Geysers supplies over 500 MW of electrical power —enough for the needs of San Francisco.

The total electrical capacity at the Geysers is now about 400 mw. A programme is underway to add about 100 MW per year for several years, at which time the field will be able to furnish as much power as that used now by the city of San Francisco. The total potential geothermal capacity at this location is estimated to be in the range of 1,000 to 4,000 MW, a sufficient capacity to serve one-half of the present needs of the greater San Francisco metropolitan area. The cost of the electricity, 1.8 per kilowatt-hour, is easily competitive with power generated in coal or nuclear plants. In Reykjavik, the capital of Iceland, a geothermal heating system keeps 100,000 people warm the year around. The skies of the city are clear of the smoke and pollution so common in cities that burn fossil fuels for heat. Iceland claimed its geothermal heating network was also more economical than an oil system, even at pre-1973 prices of $17 per gallon.

In Larderello, in central Italy, about 2,000,000 people are served by geothermal power plants. The first of these plants was put into operation in 1904, and over 400 MW are now generated. Some of the waste heat from these facilities is used to keep greenhouses warm. In several large apartment complexes near Paris, France, 30,000 people are kept warm by lukewarm geothermal water, the temperature of which is sometimes boosted with heat pumps. These apartments were all placed on geothermal heat within the last 15 years. In two American towns — Boise, Id, (100,000 population) and Klamath Falls, Ore, (20,000 population) — a significant number of the homes and businesses are heated by geothermal water. The Italian power plant at Larderello started in 1904 on a small scale now produces 540 million watts of electricity. This is equivalent to burning 1.5 million tonnes of oil in a year. New Zealand started exploration in 1950 and the Wairakei power station now produces 175 MW, which is equal to two million tonnes of oil per year. The power production in California, US, began in 1960 and has already touched 56 MW.

For the past eight years, a research program in Cornwall, southwestern England, has been studying methods of exploiting an energy resource estimated to contain the equivalent of 10 times Britain's current annual electricity consumption. A team of 60, with an annual budget of £ 3 million, has completed the first stage of a fullscale field experiment to discover if the heat within Cornish granite can be exploited economically. It is the first project on this scale in western Europe. The project in Cornwall has concentrated on specific aspects of the interlinking problem, having recognised that existing natural fractures would offer an ideal heat exchange system if they could be widened to let water pass through them. The work has involved the drilling of two boreholes to a depth of 2,000 m in the Cornish granite. The interconnection of the wells was achieved by pumping in water at very high pressure.

Many of the richest geothermal resources of this type are in developing countries — Central America, Ethiopia, Indonesia, Kenya and the Philippines. Seventeen countries are presently producing electricity from geothermal resources, and that number is likely to double before the turn of the century, and the quantities of electricity produced to increase steadily as the technology becomes better known. Lately, however, countries which have no active volcanoes, such as France and China, have also turned towards geothermal energy. Within the capitals of both countries, Paris and Beijing, warm geothermal water is tapped for the purpose of domestic heating by drilling to depths of less than two kilometres.

**Indian Scene.** The Oil and Natural Gas Commission (ONGC) plans to set up a 1000-kilowatts (KW) geothermal power plant on a pilot scale at Cambay as part of its efforts to develop non-conventional sources of energy. Research and Development activities relating to cold storage unit and 5 KW power plant both based on geothermal energy at Manikaran District Kulu, Himachal Pradesh are continuing. The pilot cold storage plant at Manikaran using geothermal energy has shown successful results. The Geological Survey of India has so far identified 340 hot spring areas in India that can be explored as geothermal energy sources and is now planning to cover Andaman and Nicobar Islands soon. Indian engineers working in Geological Survey of India has commissioned an experimental 1 KVA (kilovolt-ampere) generator running on geothermal energy in Pugga-Chumatan area of Ladakh is the first production of electricity from a hot water spring in

In North India, hot water springs occur in Ladakh and Himacha desh. In Western India they are found in Gujarat and Maharashtra. are also found in the Singhbhum region of Bihar while there are in Assam. Scientists from National Geophysical Research Inst Hyderabad, have discovered a hot zone below Garam Pani (As The survey aircraft carrying high precision magnetometer disco that the Garam Pani region is highly magnetic. The magnetic ana combined with infra-red photography have led scientists to believe molten magma from deep inside the earth has penetrated close t crust and there are valuable minerals along with steam under the gr surrounding Garam Pani.

There are national geothermal programmes in at least 70 coun in the world and over half of these countries have already gone geothermal drilling. Perhaps a third of the national geothermal grammes were started after the energy crisis. A fundamental ques that each national energy committee has to evaluate prior to launc a new energy programme is how the cost of geothermal energy c pares with other "new" alternative sources such as solar, wind and energy, and how these in turn compare with the cost of more conv tional sources such as oil and coal.

**Why isn't the use of this source growing more quickly.** There at least three reasons for the delay. Of chief concern is the risk, hence the cost, of exploration. An unsuccessful well is expensive, the cost must be recovered from successful wells. This type of c recovery is an established practice in the oil and gas industry, wh a successful well can make enough money to pay for half-dozen uns cessful wells. The revenues from a successful geothermal well, ho ever, are likely to be only one-tenth to one-third that of a very success oil well. A moderately successful oil well, for example, producing 2 barrels per day, earns about $2,000 a day. A successful geothermal w producing 1,000 gallons of 300°F water per minute, earns about $6 a day. Geothermal wells must also be larger in diameter in order handle much greater flows than oil wells, to dispose of the used wat For all these reasons, the success ratio for geothermal wells must significantly higher than for oil and gas. There is as yet little exp ience to draw on, though. Each year, about 30,000 oil and gas we are drilled in the U.S. To date, only about 500 geothermal wells ha been drilled, and one-third of these are in the Geysers geothermal fie in California. Fortunately, the success rate on these 500 geothermal wel has been much higher than 50%.

Geothermal power plants create some environmental problems whic are peculiar to them only. The effluent from most geothermal plan will be salty and may contain sodium and potassium compounds. Add tionally, in some cases lithium, fluorine, boron and arsenic compound may be present. At one of the geothermal plants in production, the brin contains 25 per cent mineral content, namely, compounds of sodiu potassium, calcium with small amounts of iron, lithium, manganese copper and silver. Thus, the effluent from a geothermal plan canno be discharged into cristin water courses unless properly treated without risking severe pollution problems. Some effluents contain boron fluorine and arsenic. These are very harmful to plant and animal lif in concentrations as low as two parts per million. Claims espousing geothermal energy as the word's saviour as an abundant, clean energy source are grossly misleading. Geothermal energy is a clean energy source from the standpoint that it is generated without a polluting effect unlike conventional fossil fuel or nuclear plants. Jay F. Kunze, a leading energy expert says: "In 30 years, perhaps, geothermal energy will be providing a significant share of the country's energy needs." One can only hope that the prediction comes true. — T.P.S. RAJA

# CHEMARENA

### S.L. VENKITESWARAN

## Acetic acid by fermentation

Acetic acid is readily produced by certain bacteria from wines or other alcoholic liquors and the product is called vinegar -- widely used for food products and condiments. The fermentation is an oxidation and is carried out continuously in special wooden fermenters filled with wood shavings as a filler for support of bacterial growth. Air is supplied from the bottom generally by natural circulation. But use of such a process for production of pure acetic acid has not been feasible as the concentration is low and costs of recovery high even if a pure dilute alcohol with mineral nutrient is used as feed to reduce costs.

However recent developments claim the use of other homoacetate bacteria -- *clostridium thermoaceticum* species which can convert sugar, glucose or xylose to acetic acid at 45 to 65°C temperature as per reactions below under anaerobic conditions:

$$C_6H_{12}O_6 + 2H_2O \longrightarrow 2CH_3COOH + 2CO_2 + 8H + 8e$$

$$2CO_2 + 8H^+ + 8e \longrightarrow CH_3COOH + 2H_2O$$

There is no waste of carbon as happens when going via ethyl alcohol and the yields are good with only water as coproduct. But the fermenter is under a blanket of carbon dioxide and the strain number ATCC 39073 of the American Type Collection is said to be the most active.

The medium is 18% glucose, yeast extract 5%, with supplements of tryptophane and mineral salts. Medium is autoclaved, gassed with $CO_2$ to pH 8.5 and innoculated. Carbon dioxide is bubbled slowly over 24-48 hours. But the process cannot be competitive technologically though it is a biochemical success -- cost of recovery would be high through the usual extraction with ethyl acetate and distillation. Use of pure glucose with 5% of yeast extract is also prohibitive in costs. Xylose is cheaper but there is lower yield. So there is no fermentation process for pure acetic acid in prospect.

The process for propionic acid from glucose is also successful with other bacteria but even here the costs of recovery are high. Some work was done at Hindustan Lever Research Centre but apparently not pursued. The NCL process of carbonylation of ethyl alcohol with special Rhodium-based catalyst is a success with the prospects of commercial production soon.

## Homogeneous Catalysts

The carbonylation of methanol or methyl acetate to acetic acid and acetic anhydride is an excellent case of successful homogenous catalyst system using precious metals -- Rhodium -- without any wastage. New commercial pathways using such catalysts to produce valuable products usually made by conventional processes has been the subject of a special symposium under Catalysis and Surface Science Secretariat (in USA) -- brief report in *CE News*, of 21st May.

The Eastman Chemical's acetic acid/anhydride plant in Tennessee was the subject of great interest and a presentation was made of the process and its complex pathway (see Fig. 1). The plant capacity based on synthesis gas from coal is to be doubled soon. The iodine promoted Rhodium catalyst has similarity to Monsanto's but with differences which avoided Patent violation claims. A detailed mechanistic investigation of the reaction scheme using in line high pressure infrared spectroscopy was made. Experimental yields were 99%. One of the unique features of the carbonylation of methyl acetate is for the reducing agent -- hydrogen -- to reach and maintain high reaction rates. It also requires a cationic promoter and lithium iodide was chosen. Now British Petroleum have their own version for acetic anhydride via carbonylation and plant operation in UK.

Catalysed additions of hydrogen cyanide to olefins is a reaction used by Du Pont for making hexamethylene diamine (via adiponitrile). There is a study now of hydrocyanation of certain vinylarenes as a way to ibuprofen and naproxen -- anti-inflammatory drugs. Tetrakis (bisp-tolylphosphite) -- nickel is said to be effective for regiospecific hydrocyanation. *Nafion* (perfluro ethyl ion exchange polymer) of Du Pont is said to be inert support for a highly active cyclopropanation catalyst (could lead to easier routes for synthetic pyrethroids). *Nafion* support for the catalyst enables recovery of the costly catalyst (Rhodium based) -- a drawback of homogenous catalyst systems. Du Pont chemists have succeeded in tail-to-tail dimerisation of acrylonitrile as an alternative route to adipic acid based on $C_3$. This method has meanwhile helped to produce 2,3-disubstituted cyclopentanones -- possible intermediates for prostaglandins and anti-tumour agents. Expensive catalysts and expensive solvents and their recovery is the major problem. These appears to be new pathways for biologically active complex molecules with the use of these complex cataylsts whether in homogenous medium or on supports. The synthesis of water soluble transition metal complexes widely used for hydrogenation, hydroformylation, carbonylation etc. is an area of intense research.

The developments of general techniques for functionalised hydrocarbons is another area of much interest for use of homogeneous catalysts. Rhodium and irridium complexes have been found to activate C-H bonds at room temperature and alkane oxidation reactions were possible as per studies in Japan's National Chemical Laboratory. This team in Japan is studying (Rh Cl(CO)-[P $(CH_3)_3]_2$ and irradiation with UV light as a way for carbonylation under mild conditions. These catalysts are highly rigid selective but we are yet to see the potential for commercial outlets. Amino carbonylation as a way to amino acids from aldehydes is a way to avoid use of hydrogen cyanide. Two cataylst systems -- $Co_2(CO)_8$-HRh (CO-$[P(C_6H_5)_3]_3$ and $Co_2(CO)_8$-$(C_6H_5)_2P(CH_2)_3P(C_6H_5)$ were found to be effective for hydroformylation and amido carbonylation and their use has led to N-phenylglycine and phenylalanine. It is possible that many more such processes may emerge in the next few years.

There is good potential of using such catalyst systems to transform hydrocarbons for various derivatives as indicated in the chart (Fig. 2) but it may take some years.

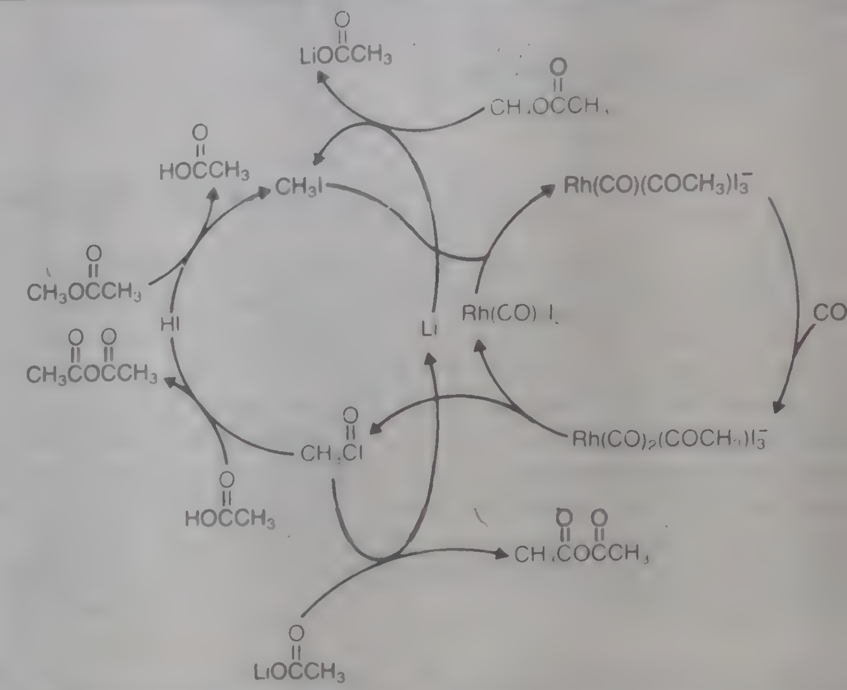

$LiOCCH_3$
$CH_3OCCH_3$
$HOCCH_3$
$CH_3I$
$Rh(CO)(COCH_3)I_3^-$
$CH_3OCCH_3$
HI
Li
$Rh(CO)I_2^-$
CO
$CH_3COCCH_3$
$CH_3CI$
$Rh(CO)_2(COCH_3)I_3^-$
$HOCCH_3$
$CH_3COCCH_3$
$LiOCCH_3$

Fig. 1: Carbonylation of methyl acetate to acetic anhydride involves complex mechani

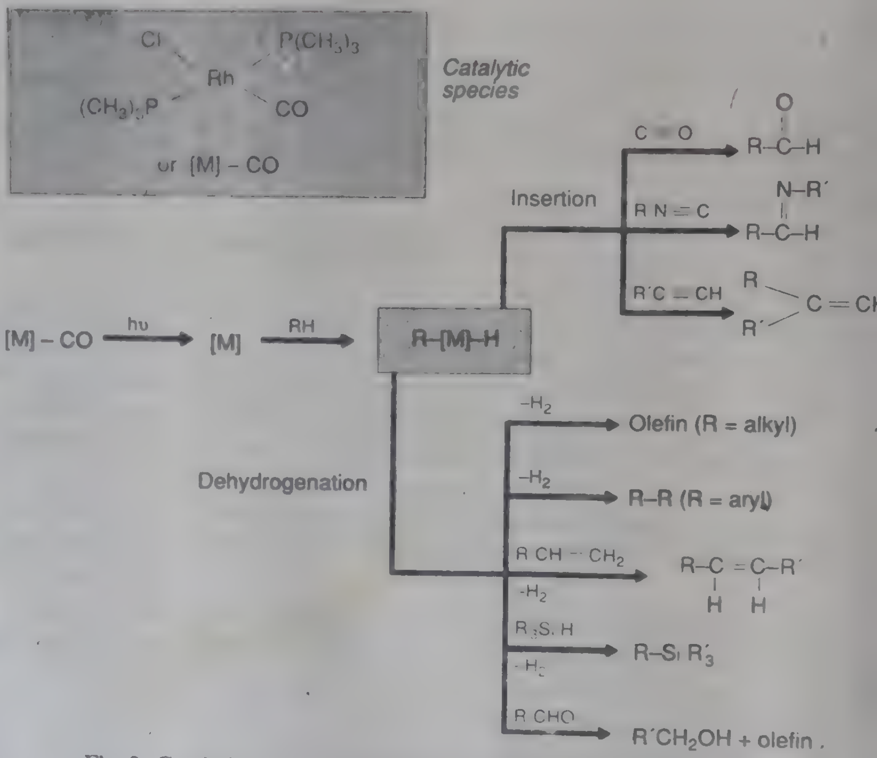

Cl
$P(CH_3)_3$
Rh
$(CH_3)_3P$
CO
or [M] - CO
Catalytic species
Insertion
C = O
R–C–H
RN = C
N–R′
R–C–H
R′C ≡ CH
R
C = C
R′
[M] – CO
hν
[M]
RH
R–[M]–H
Dehydrogenation
$-H_2$
Olefin (R = alkyl)
$-H_2$
R–R (R = aryl)
$RCH = CH_2$
$-H_2$
R–C = C–R′
H H
$R_3SiH$
$-H_2$
$R–SiR'_3$
RCHO
$R'CH_2OH$ + olefin

Fig. 2: Catalytic system transforms hydrocarbons under mild conditions

For Competitive Imports of Chemicals, Pharmaceutical Raw Materials and Particularly for the Following Items

**Propylene Glycol Tech/USP**
**Phthalic Anhydride**
**Monomethylamine 40%**
**Dimethylamine 40% and 60%**
**Trimethylamine**
**Dimethyl Formamide**
**Tetra Hydrofuran**
**Sodium Bichromate**

PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

CHEMET केमेट

**CHEMET**

HEAD OFFICE:
Taj Building, 1st Floor, P.B.No. 195, 210, Dr. D.N. Road, Bombay: 400 001
Phones: 2043803/4/5/6/7 Fax. No. 2048854
Cable: DEGUCHEM Bombay Telex: 11-3229/11 4631 DGKM IN

CALCUTTA OFFICE:
Sharma House, 3rd Floor, 1/2 Lord Sinha Road, Calcutta-700 071
Phones: 447306 ■ 446155, Cable: DEGUCHEM Calcutta, Telex: 21-33 25 DGKN IN

MADRAS OFFICE:
10, Kondy Chetty Street, 1st Floor, P.B. No. 1709, Madras 600 001. Cable: DEGUCHEM, Madras
Phones: 582447 ■ 587617 ■ 580796 Telex: 41 7554 DGKM IN

DELHI OFFICE:
214, Hans Bhavan, Wing No. 1, Bahadurshah Zafer Marg, New Delhi - 110 002
Phones: 3311373 ■ 3319787 ■ 3319791 Cable: DEGUCHEM New Delhi,
Telex:31 65921, DGKM IN.

HYDERABAD OFFICE:
905/2, 9th Floor, Babukhan Estate, Basheerbagh, Hyderabad-500 001.
Phone : 242318, Telex: 0425 - 2188, DGKM IN.

# Chemplast to modernise, expand PVC production

A Rs. 45-crore modernisation programme has been initiated by the Chemplast group among other things to expand its PVC prodcution.

This is sought to be achieved by making available increased supply of industrial alcohol, the critical input for PVC production. The company will be debottlenecking its Panruti, Tamil Nadu plant ensuring enhanced supply of industrial alcohol.

This alone will cost Rs. 25 crores. The company will be putting up the second genset of six mw capacity at a cost of Rs. eight crores for which the central government has given its green signal. The remaining amount will be utilised for other purposes. This is the first major modernisation programme that the company has undertaken.

The sources of finance for the modernisation plan will be Rs. 15 crores non-convertible debentures (which will be privately placed with the institutions), Rs. 13 crores to be raised from ICICI/IDBI, Rs. 5.5 crores term loans from banks and the balance Rs. 11.5 crores will come from internal resources. The company's net worth is Rs. 32.51 crores.

The debottlenecking programme, which will be completed by March 1991, is aimed at removing the limitations in the monomer section and getting increased output at the tap-II at Panruti. It will involve upgradation of technology by switching over to continuous fermentation process, from batch fermentation which means additional yield of alcohol per tonne of molasse.

With the enhanced production of industrial alcohol the (PVC) plant at Mettur will be assured of continuous supply of the critical input. The decision to go in for modernisation is also timely in the sense that the Tamil Nadu Government has decided to manufacture economy-class liquor from July 21, which the company felt might pose problems of supply of alcohol.

There has been a shortfall of PVC resulting in import of the item at the rate of 1.75 lakh tonnes per annum valued at $130 million according to industry sources. There have also been some delays in the creation of additional capacities. Reliance, Finolex were among others who had been preparing to hit the market with 10,000 tonnes capacity each.

The country's present estimated production is around 1.5 lakh tonnes only, though the combined capacity created is 1.75 lakh tonnes, including that of Chemplast, modernisation programme of Chemplast will result in additional turnover of Rs. 30 crores from the PVC division alone. The present turnover is around Rs. 60 crores.

---

## BALLARPUR INDUSTRIES' SHOWS EXCELLENT PERFORMANCE

Ballarpur Industries is busily engaged in the modernisation of its two paper mills in Yamunanagar in Haryana and Ballarpur in Madhya Pradesh. The programme relating to the latter unit is scheduled to be completed by the end of this year. A new pulp mill based on eucalyptus wood will be erected in Yamunanagar while the paper machines and coating plant will be revamped. A cast coating plant also will be coming up in this centre. The outlay of Rs. 200 crores on these schemes will be met through borrowing and internal resources and there will be no issue of additional capital for this purpose.

### Rs. 200 crores modernisation plans

The captive caustic soda and chlorine plants in these two centres will also be using membrane cells in place of the existing mercury cells. The chem complex in Karwar in Karnataka will be changing over to the membr process. This will be helpful in sav energy consumption significantly the cost of these projects will be Rs. crores. While the modernised facili will be resulting in an increase in output of paper and boards, efforts also being made to improve the ava bility of raw materials by undertak social forestry programmes. The p duction of aniline along with o chemicals too will be taken up in Vis hapatnam and the capacity will 10,000 tonnes annually. A sick u Sewa Paper Mills in Orissa, is be accquired while the Straw Board M of Modern Stramit (India) at Ra mundri also will be taken over. A project is being implemented in Ma rashtra for producing extensible s kraft paper involving an outlay Rs. 60 crores.

### Diversification into new areas

The activities are also being dive fied in new directions. A project manufacturing glass containers wi capacity of 200 tonnes daily is com up in the Union Territory of Po cherry and is scheduled to be in op tion in 1990-91. The plant for turn out aerated autoclave concrete, a s stitute for bricks with the technolog West German interests, is being e cuted in Palwal in Haryana. A sub iary, Toscana Shoes, will be produc shoe uppers in its plant in Gurgaon Delhi. As the technology for pa making and use of raw materials of ferent types are to be popularised, a s sidiary, Bilt Treetech Pvt. Ltd., wil evolving scientific and modern meth of propagating saplings of various species useful for pulping, floricult farm and social forestry.

An entry is also being made into field of chemical engineering with acquisition of a chemical enginee consultancy firm, Krebs and Cie of C cutta, and it has become a subsidiar Ballarpur Industries.

# TEPIC - G

THE REVOLUTIONARY CONCEPT IN
POWDER COATING MANUFACTURE

Tris(2,3-Epoxy Propyl) Isocyanurate

Alternate name: Triglycidyl Isocyanurate (TGIC)

TEPIC-G is one of the basic raw materials for powder coatings, a field having tremendous growth potential.

A combination of TEPIC - Polyester resin gives the best mechanical properties to the powders including excellent thermal, electrical and weather resistances.

For further details, please contact:

**PRIYA CHEMICALS**

HEAD OFFICE:
Podar Chambers, 4th Floor, S.A. Brelvi Street, Bombay 400 001
Phones: 2860596 ■ 2863611 ■ 2863676 ■ 2863783 ■ 2863900
Telex: 0118-5495 PRIA IN ■ 0118-6556 PRIA IN ■ 0118-2472 PODR IN

BRANCHES
— HYDERABAD OFFICE —
Prashanthi Commercial Complex, 6-9-30/6 to 8/B, 2nd Floor, Basheerbagh,
Hyderabad - 500 029 Phone: 236068

— DELHI OFFICE —
Flat No. 8, 10th Floor, Akash Deep Bldg., Barakhamba Road, New Delhi - 110 001
Phones: 3314512 ■ 3310413

— BANGALORE OFFICE —
Devatha Plaza, 131/132, Residency Road, Bangalore - 560 025 Phone: 214027

— MADRAS OFFICE —
5-J Century Plaza, 560-562 Mount Road, Teynampet, Madras 600 018.
Phone: 451597 ■ 451031 Telex: 041-8809 PRIYA IN

— CALCUTTA OFFICE —
"LORDS", 3rd Floor, 7/1, Lord Sinha Road, Calcutta 700 071
Phone: 222378 ■ 222379 ■ 228015 ■ 226367 ■ 300765

### CHAVARAN TITANIUM FACTORY

# No decision yet on Tata's take-over offer

Industries Minister, Mrs. K.R. Gowri Amma informed the Kerala Assembly on July 19 that neither she nor the LDF Government in Kerala had taken a decision so far on the Tata's offer to take over the State Government owned titanium factory at Chavara near Quilon.

Mrs. Gowri Amma who was replying to the debate on the demand for grant to the industries department said Tatas were invited by her after having heard that they were proposing to start a new titanium dioxide factory. In the course of the discussion Tatas asked for Kerala Metals and Minerals Ltd., (KMML), a State Government unit at Chavara. The request was before the Government but no decision has been taken so far.

In the course of the debate there was strong criticism from the Opposition against selling off this unit to the Tatas as the Government was enjoying a monopoly in the production of titanium dioxide. They made caustic comments about change in the anti-monopoly policy, so far professed by the CPI(M), and extending a red carpet welcome to Tatas and Birlas.

Mrs. Gowri Amma said KMML was a unit which had accumulated a loss of Rs. 88 crores so far and had eaten away the bulk of its capital. She blamed the workers for the present plight of this industry. She said the workers had formed a 'united front' irrespective of their political differences to fight the MD who was a technocrat. This was very unfortunate.

Mr. Vayalar Ravi Congress(I) member and President of the INTUC unit in this factory blamed the MD for the present condition of the factory which started production only five years ago and the Government's policy of hiking up the price of the titanium dioxide produced in this factory without taking into consideration the imported price of the commodity. The factory was now charging Rs. 84,000 per tonne for rutile grade titanium dioxide as against Rs. 80,000 for the imported material. Consequently, stocks got accumulated in the factory. Moreover, there were some technical snags also in the plant. How could the workers be blamed for all these, he asked. It was the management which should be blamed for the loss suffered by this unit, he said.

Meanwhile, Mr. Vayalar Ravi said that the Industries Minister and her team did not do the necessary home work before going to America without the consent of the US Government and the Government of India it was not possible to bring in any money from that country, he said. The Industries Minister said the State Government had discussed the proposal to set up a Kerala growth fund with the Finance Minister, Mr. Madhu Dandavate, the Reserve Bank of India and the State Bank of India. Actually the forms distributed among the prospective investors were prepared by the State Bank of India, she said.

Answering the criticism that the LDF Government had no industrial and labour policy she said the essence of the Government policy was "reasonable profit to the entrepreneurs and fair wages to the workers". It was true that the LDF Government had not issued a formal industrial and labour policy statement. The Government was functioning on the basis of its election manifesto. The Government had no objection in considering the demand which was voiced by a senior member of the ruling front (Mr. Chitharangan of the CPI) that the industrial and labour policy of the Government should be clearly spelt out, she added.

The Industries Minister claimed that a welcome result of the industrial and labour policies followed by the LDF Government for the last four years was the impression that Kerala was a s
place to invest money. Labour front h
become peaceful with lesser number
strikes, lockouts and lay offs.

She claimed that LDF Governme
could reopen all but two factories whi
were closed due to labour troubles
other reasons during the time of the p
vious Government. The Governme
was trying to reopen the remaining tw
the Punalur Paper Mills and the T
Chemicals. Mr. Dalmia, the owner
Punalur Paper Mills, had approached t
Government with the reports that t
ICICI has agreed to waive all the inte
est dues on borrowings by this unit. T
Minister said she has told Mr. Dalm
that the Government has no objecti
in his running the factory if he coul

It was also her claim that the pe
formance of the public sector uni
under the State Government could
improved. The number of units runnin
at a loss could also be brought dow
She said four medium scale unit cou
be set up in the last three years. Th
was all that was possible with the lim
ited resources available to the industri
department. She said that during the la
three years 23,386 small units, includ
ing village industries, had been estab
lished and it was possible to provid
employment for three lakh people add
tionally. After the Minister's reply th
demand was put to vote and passed b
the Assembly.

## DRUG PSUs TO BE RESTRUC-TURED

The Union Government will restruc
ture public sector drug units to ensur
their growth. Addressing a meeting o
the chief executives of the drug units
the Minister of State for Petroleum an
Chemicals, Mr. Bhajman Behera, sai
the Government would soon undertak
an exercise to reorganise the pharma
ceutical PSUs so that they becom
administratively more homogenous an
there was no undue competitio
between them.

# Rs. 66.35 crores fine on Glaxo

The Government has slapped a mas- e fine of Rs. 66.35 crores on Glaxo dia Ltd. for overpricing betametha- ne, one of its main line products. It s forced Glaxo, to seek legal protec- on from the Delhi High Court. A large imber of companies have been receiv- g notices for payments into Drug ices Equalisation Account (DPEA) it Glaxo beats them all. Perhaps the insitry of Chemicals and Petrochem- al is picking on Glaxo for its scale of perations.

The company got a notice on June 25 cough up Rs. 66.35 crores tentatively r higher prices charged between 1981- 7 and ordered to reply before July 6. he company sent in its letter on July explaining that it is no position to pay p such large amounts especially as the rder does not explain the provisions nder which it has been issued.

After the Delhi High Court case in 981 involving the compnay, the gov- rnment raised prices of betamethasone n 1987 and 1989 as it is a scheduled rug. The case of Glaxo came up for earing in Delhi High Court on July 16 nd the court has given notice to the Government to give a reply for it to lecide. The case comes for hearing on August 9.

Glaxo is the first company to seek egal redress over the moves initiated by Mr. M.S. Gurupadaswamy, the Union Minister, to make drug companies pay ıp dues under DPEA. The order on Glaxo is in lieu of the earlier order to pay up around Rs. 37 crores. If Government insists on the drug industry paying all the dues for which it has sent in notices, there may not be anything left for the industry to do but to curtail operations.

No company, in principle, objects to the Government invoking provisions of DPCO 1979, provided the aggrieved party is also given a chance to explain. In a comprehensive document, the Indian Drug Manufacturers' Association, has pleaded for considering the total period of gains and losses till abolition of DPEA in 1987. It says, it is totally unfair to pick and choose period of gains and totally ignore period of losses. Secondly, the benefits of reduced costs passed on to Government institutions and needy patients should be allowed as a set off, IDMA argues.

The other factors it wants to be included are: a) determine dues from a manufacturer, after setting off, simultatneously, claims of losses on other bulk drugs; b) as export are outside purview of objective of DPCO 79, exclude purchases for exports; c) determine actual unintended profits retained by considering all true cost elements and not merely one factor only.

With Glaxo taking the lead in going to court other companies are likely to join. In fact, industry associations like IDMA and Organisation of Pharmaceutical Producers of India (OPPI), are seeking legal opinion to move the judiciary.

## HIND. CIBA-GEIGY TO INTRODUCE HIGH BP DRUG

Hindustan Ciba-Geigy Ltd. will shortly be introducing a major drug for treatment of high blood pressure. The drug, coming from its parent company, Ciba-Geigy, has already got approval for marketing in France and four South American countries. Company sources point out that the drug "Cibacen" will be put to clinical trials involving more than 2,000 doctors and 15,000 patients throughout the country. The company is hopeful of getting the Government's approval to market it in India.

Early this year, Hindustan Ciba-Geigy Limited put out a drug, "Metroprolon", which was well received. In the next couple of years, a few more drugs for cancer treatment and major ailments will be put out, says Dr. Christopher Wicks, Head of Pharma International's Medicine Division (Ciba-Geigy).

For the most competitive CIF price of

SODIUM FORMALDEHYDE SULPHOXYLATE (RANGOLITE)

Please Contact:

Mr. DHAIRESH K. SANGHVI

M/s. KANTILAL SANGHVI & CO.

Union Co-operative Insurance Bldg.,
23, Sir Pherozeshah Mehta Road,
BOMBAY 400 001.
Phones: (Office): 2870836/2873217/2873628
(Resi.): 4226850/4229086
Telex: 1185725 EXIM IM Gram: EXPIM, Bombay
Fax: (22) 2874153

# Excessive controls will hit drug production and distribution

The pharmaceutical industry and the trade represented by the three industry associations — The Indian Drug Manufacturers' Association (IDMA) —Organisation of Pharmaceutical Producers of India (OPPI) — The Pharmaceutical & Allied Manufacturers' & Distributors Association Ltd., (PAMDAL) and the All-India Organisation of Chemists and Druggists (AIOCD) are seriously concerned about the move of the Union Ministry of Petroleum and Chemicals to make arbitrary changes in the drug policy 1986 and the Drugs (Prices Control) Order, 1987.

The changes proposed are substantial increase in the number of drugs under price control, having a single category of price-controlled drugs, reducing the maximum allowable post-manufacturing expenses (MAPE) and trade margin. The Ministry is also making unjustified demands on drug companies to pay large sums running into crores of rupees into the defunct Drug Price Equalisation Account (DPEA). If adopted and implemented these measures will undermine the viability of drug industry and the trade, render manufacture and distribution of essential medicines uneconomic, resulting in stoppage of production and shortage of essential medicines to the consumer.

The pharmaceutical industry and the trade are at a loss to understand the logic or compulsions behind this move which marks a complete reversal of the earlier policy. This policy was announced in 1986-87 after many years of study and review by several expert committees and working groups. It represented a progressive step towards a more pragmatic and growth-oriented policy.

As a result of this policy, production of bulk drugs increased substantially from Rs. 458 crores in 1986-87 to Rs. 610 crores last year (1989-90) and of formulations from Rs. 2140 crores to Rs. 3360 crores. Export of drugs boomed from Rs. 223 crores in 1986-87 to Rs. 600 crores last year and is expected to reach Rs. 720 crores in the current year.

Since 1986-87 there has been a revival of new investment in the industry. Several new projects have been blueprinted which will increase production, make available more surplus for export and create more employment opportunities. All these encouraging developments will be negated if there is a sudden change in policy. The pace of progress will be put in reverse gear and stagnation in investment, production and export will again set in.

This is unfortunate at a time when the country's economy is poised for faster development and the new Government is making genuine efforts to stimulate industrial growth, dismantle unproductive controls and encourage competition and cost reduction. It is ironic that when a new wind of liberalisation and competition is blowing over the national economy as a whole, one sector of it is singled out for discriminatory treatment.

The Department of Chemicals and Petrochemicals, which is the administrative department in-charge of the pharmaceutical industry, talks of "further relaxation of price control" with the "ultimate aim of complete decontrol of prices with the Government retaining only the power to impose control on products where it is considered necessary on selective basis". But every action of the Ministry of Petroleum and Chemicals in the past few months goes counter to the letter and spirit of this statement.

The industry and the trade find it difficult to understand or appreciate the rationale of the changes contemplated. Take price rise for example. Price increase has been minimal in pharm
ceuticals compared with other items
common consumption, utilities and se
vices. The average rise in drug price w
5.3% in 1988, 5.5% in 1989 and 6.3
in 1990 as compared to the base ye
1987 (July). This also compares favou
ably with the general inflation rate in t
economy which was 10.7% in 1987-8
5.7% in 1988-89 and 8.8% in 1989-9
according to the Government's Ec
nomic Survey, 1989-90. Even in the fe
cases where price increase were mo
than the average, (e.g. some deco
trolled drugs) the increase has tak
place after several years and is fully ju
tified by cost escalation.

The pharmaceutical industry and t
trade are not opposed to a review of t
drug policy. We have already subm
ted comprehensive suggestions to t
Ministry to achieve the national obje
tive of more production of essent
medicines, increasing exports and mai
taining prices at reasonable levels. W
believe that the policies alrea
announced should be fully and spee
ily implemented before changes a
made.

A closer look at the implementati
of DPCO 1987 shows that, even aft
the lapse of three years, the Order h
not been fully implemented:

(a) Prices of only 68 bulk drugs o
of a total of 150 under price contr
have so far been fixed/revised; the ba
ance of about 82 bulk drugs are st
being sold at the old prices despite t
fact that they have become uneconom
due to the escalation in the cost of a
inputs, services and utilities.

(b) Applications for revision of fo
mulation prices are kept pending sin
October 1987 even while inputs cos
continue to escalate. Several formul
tions have become uneconomic to t
manufacturers due to cost escalati
without corresponding price adju
ments.

(c) Conversion and packing norm
were revised in 1989 after about

FOR YOUR IMPORTS AT COMPETITIVE CIF PRICES

Hydroxylamine Sulphate
Pyridine Pure 2°
Neopentyl Glycol
Ortho Chloro Benzoic Acid
Ortho Chloro Benzaldehyde
Diethylene Glycol
Thiourea
Hydrogen Peroxide
Methyl Isopropyl Ketone
Ortho Chloro Phenyl Acetic Acid
Furazolidone
Beta Naphthol
Trimethyl Phosphite
Triethyl Phosphite
Dimethyl Thio Phosphoryl Chloride
Diethyl Thio Phosphoryl Chloride
Tertiary Dodecyl Mercaptan
Methane Sulphonyl Chloride
Methane Sulphonic Acid
Thiophene
Thiophenol
Lactose (Ex NCZ)
Glyoxyllic Acid
Alkyl Benzene Hard
Dimethyl Sulphoxide
Pivaloyl Chloride
Methyl Chloro Formate
Melamine
Dimethyl Sulphate
Piperazine Anhydrous
Stannic Chloride
Propiophenone
Propionic Chloride
Cellulose Powder
Benzaldehyde FFC
Isopropyl Alcohol
Methyl Ethyl Ketone
Propylene Glycol (Ex Arco)
Bromhexine HCl
2,4 Dichloro Toluene
Epichlorohydrine

Please Contact for further details:

**S. AMIT & CO.**

A TRUSTED NAME FOR IMPORT OF YOUR CHEMICALS
105, Neelam Centre, "A" Wing, Hind Cycle Road,
Worli, Bombay 400 025.
Phones: 4934627-28/4933310
Cable: "DULICTOL"
Telex: 011-76877 CMIT IN
011-74486 AMIT IN
Fax No.: 22-494950-4
Madras Office: Queens Court, 134, Montieth Road, Madras 600 008.
Phones: 860172/866942
Hyderabad Office: 8-3-215/7 (First Floor), Srinivasa Nagar Colony (West),
HYDERABAD-500 890.
Phone: 35110

Our Associates: M/s. CHEM AMIT

years. Price revision based on these revised norms has only been partly implemented.

(d) The industry's profitability, which had reached a nadir of 3-4% pre-tax on sales in 1986-87 had shown some improvement last year; this trend has again been reversed. The pharmaceutical business of several major companies continue to be unviable and are subsidised by non-pharma business and exports.

The Eighth Five Year Plan is currently being formulated. According to the Planning Commission's Working Group's estimates, drug production in the country has to be more than doubled during the plan period from Rs. 3,500 crores at present to Rs. 8,000 crores in 1994-95. Additional investment required during the plan period is estimated at Rs. 400 crores out of which Rs. 250 crores are for bulk drugs and formulations. Export is targeted to increase to Rs. 5,000 crores by the year 2000. Essential medicines produced in the country have to be distributed more widely, particularly in rural areas. The distribution trade has a vital role to play in this priority national task.

These ambitious targets can be achieved only if appropriate incentives are provided to industry and the trade to expand and grow. The best means of growth comes from within. Unless the industry and trade are allowed a reasonable return on their investments, the Eighth Plan targets are unlikely to be achieved. Incidentally, the industry has not been able to achieve the Sixth and Seventh Plan targets of production.

The policy support needed by the industry and the trade are:

1. There should be stability and continuity of Government policies. Frequent changes in policies create uncertainties and lack of confidence.
2. There should be no major change in categorisation of drugs. Nor should more drugs be added to the price control basket which currently accounts for over 75% of the market in terms of sales.
3. The span of control should be progressively reduced with ultimate aim of complete decontrol.
4. To ensure the economic viability of the industry and trade MAPE and margin should be revised upwards so that both these two important sectors of the pharma business can serve the consumer with abundant supplies of quality medicines.
5. Relief under the existing DPCO way of price revision based on cost data should continue till changes in the policy are announced.
6. Rational use of loan licensing should be encouraged and continued to increase production of quality drugs at reasonable prices.
7. The trade plays a vital role in distribution of drugs throughout the country. It is entitled to a fair margin to cover the cost, to ensure a reasonable return on investment and to encourage distribution penetration into rural areas.
8. Since the drug prices are statutorily fixed by the Government all non-recoverable taxes such as turnover tax and surcharge, etc., should not be levied on the trade.
9. In view of the vital role the trade plays in distributing essential and life-saving medicines in the far corners of the country, bank loans at concessional rates should be made available to the trade, particularly because it operates on very slender profit margins.
10. The pharmaceutical trade cannot be compared with any other trade and as such due encouragement and recognition should be given to this profession as in other countries.

## CCS ON INDUSTRIAL ALCOHOL OFF

Cash compensatory su
(CCS) on export of industrial
hol has been withdrawn.

A CCS of 10 per cent has
introduced with effect from Ap
1989 for a period of three years
ject to a review after one yea

The Government has now
drawn the incentive bec
alcohol-consuming industrie
deficit states like Gujarat, Karna
and Kerala are not getting their
plies. Even distillers in surplus s
of Uttar Pradesh and Tamil Nad
keen on exports.

The Government had autho
All-India Distillers Associatio
export, only part of the quantity
ted by the Government. The u
lised allocation of the previous
had been added to this year's
cation.

AIDA has been champio
exports in view of the attra
international price and the ince
of cash assistance. AIDA can
tinue to export but new exports
not be eligible for CCS.

If appropriate policy support is
coming both the industry and the
assure the Government and cons
that essential medicines will be
duced in abundance and distri
throughout the country.

The Government's objectiv
making available medicines for th
can be achieved by subsidising
tial medicines supplied to the poor
the national health programmes
industry has in the past offered
cines for Government's health
grammes at specially low pric
stands by this commitment and i
ling to make its contribution to s
this national problem.

# IDPL Muzaffarpur unit to be closed?

Although there is no official announcement about it, several trade unionists and political leaders believe that a move is afoot to close the Muzaffarpur unit of the Indian Drugs and Pharmaceuticals Ltd. (IDPL) located in north Bihar.

As expected, they have made much hue and cry against it and flooded newspapers with statements demanding withdrawal of any move in this regard. Their main plea is that this is one of the few industries which north Bihar has. The closure of this unit, therefore, would cause a big setback to the working force in the region.

The latest to join the anti-closure squad is a Congress(I) man of the area, Mr. Hemant Shahi, who had unsucessfully contested the last assembly election from Vaishali constituency in Muzaffarpur district, Mr. Shahi has threatened to hold a "dharna" at the gate of the unit to forestall any such development.

The "move" has been also opposed by different trade union groups and opposition parties including the Janata party. Most of them have either written or sent word to the concerned ministry at the Centre.

Since Muzaffarpur is represented in Lok Sabha by the union railway minister, Mr. George Fernandes, he has been urged to see that the unit is not closed despite the constraints faced by it.

Two major problems have dogged the unit since inception — power and raw material shortage. North Bihar is a power-deficit region, so it should have got a captive power plant. But due to resource crunch it could not go for this arrangement.

Alternatively, the Bihar State Electricity Board was asked to provide a special feeder to this unit.

This was done sometime back. But this arrangement too could not work to the satisfaction of the unit for some reason or another.

Raw material shortage is its another constraint. The unit, according to official sources at Patna, is designed to use 20 million litres of industrial alcohol per annum.

A linkage with distilleries was provided for the purpose. But frequent hikes in rates of this raw material and non-supply of adequate quantity of alcohol often led to cuts in production.

Primarily for these two reasons the unit set up with Swedish collaboration never had the going good. However, closure is one thing which neither the workers nor the trade unions had foreseen.

CIF OFFER FOR YOUR ACTUAL IMPORTS

**1:3 Dichloro Acetone**
**Meta Hydroxy Benzaldehyde**
**2-Amino Thiophenol**
**Propiophenone**
**2-Chloropyridine**
**C-Acid**
**2B-Acid**
**4B-Acid**
**Acrylic Acid**
**Butyl Acrylate**

TI & M LIMITED

TIM

GPO BOX 1308, BOMBAY -1 PH: 2870903/4, 2870492 TELEX: 11-6378.2216
PO BOX 9151, CALCUTTA-16 PH: 442595-9 TELEX: 21-7359/5187
PO BOX 1960, MADRAS-1 PH: 514261 TELEX: 41-8301
DELHI-17, Community Centre PH: 667177/662004

# Drug industry threatens two-day stir

The pharmaceutical industry in the country, including chemists and distributors, is planning to down shutters nation-wide on August 7 and 8 to press their demands with the government. The industry's representatives will also hold a rally in Delhi on August 8, and hand over a memorandum to the Prime Minister. The closure is estimated to involve a production loss of about Rs. 20 crores.

In this effort, pharmaceutical manufacturers have joined hands with the distribution trade for the first time. A joint council specially formed for the purpose comprises the Indian Drug Manufacturers Association (IDMA), the Organisation of Pharmaceutical Producers of India (OPPI), the Pharmaceutical & Allied Manufacturers & Distributors Association Limited, and the All India Organisation of Chemists and Druggists.

Although about 2.5 lakh chemists all over the country are expected to take part in the stir, the joint council will arrange for dispensing counters to be set up at select centres to cater for the needs of those in urgent need of medicines. The council will publish telephone numbers and addresses of these counters in the press before the strike. In addition to the strike, the council will also issue an open letter to the Prime Minister and release advertisements presenting their case, in the national newspapers. The industry's major concern relate to apprehensions that the government will change the drug policy of 1986 and bring more drugs under price control.

The industry wants the government to let the 1986 drugs policy and the Drugs (Prices Control) Order of 1987 to run its full course, bring about progressive decontrol of drugs, automatic price escalations, and set-offs aga claims made on various compa under the Drug Price Equalisa Account.

Besides these, the industry also w the mark-ups on Category I and II mulations to revised upwards to 10 cent and 125 per cent respectively. joining hands with the manufactu the distribution trade expects trade r gins to increase for retailers from 16 cent to 20 per cent on controlled dr and for stockists from the averag eight per cent to 10 per cent.

Dr. S. Agarwala, president of OPPI, said that there was sufficient for the government to meet the in try representatives before the prop two-day closure, and resolve the ation. He, however, said that " assurances will not do; the indu wants specific assurances that wi adhered to.

C.D. CORPORATION IS PROUD TO OFFER
SPECIALITY AUXILIARIES FOR FINISHING

**BTRANOL** : Versatile Stain Remover for cotton synthetics and their blends (BTRA process)
**ULTRA DD PASTE** : Powerful Anionic Detergent Paste
**ULTRA NC** : Highly Efficient Non-ionic Surfactant With Powerful Wetting-out and Detergent Properties
**FINOMERC C** : Powerful Non-cresylic Mercerising Auxiliary
**CIDASCOUR LTJ 100** : Energy Saving Aid for Low Energy/ Rapid Scouring-cum-Bleaching
**CIDAPER CL** : Effective Chelating-cum-Stabilising Agent for Peroxide Bleaching
**SYNTHOBLEACH K** : Excellent Bleaching Agent for Synthetics and their Blends

For further details contact manufacturers
C.D. CORPORATION
Kamani Chambers, Gr. Floor, 32, R.K. Marg, Ballard Estate, Bombay 400 038.
Tel.: 2617801-2, 2612817, 2619994 Gram: "UDAY" Bombay 400 038. Tlx.: 11 76581 JHPL IN
ADVT. N

# MBL to set up bulk drug project

Mysore Breweries Ltd. (MBL), as part of its diversification programme, is setting up a bulk drug project in the Kunigal industrial area for manufacture of antibiotics besides going in for property development in Bangalore. The estimated project cost of the bulk drug project is likely to be anywhere between Rs. 3 and Rs. 5 crores, while the investment on property and land development is about Rs. 1 crore.

The MBL Managing Director, Mr. K.P. Balasubramaniam, said at present they are negotiating with more than four parties, drawn from France, Italy and the US to obtain technical knowhow for production of antibiotics like sulphamethoxazole (SMS) and trimethoprim (TMP). These drugs are said to be import substitutes.

The company managing director said that the Karnataka State Government had already allotted about six acres of land to them. The commercial production at this unit is likely to commence during 1991. MBL is likely to add some more bulk drug during the course of the year. According to the Managing Director, MBL Pharmaceuticals Division is likely to produce 30 tonnes of three selected drugs during the first year, which would be enhanced in the subsequent years. The production capacity of SMS and TMP is likely to be around 70 tonnes per annum.

Mr. Balasubramaniam said that they would commence the work soon after getting the technical knowhow from the collaborator. The finalisation of the technical collaborator for single drug or multiple drug would be arrived at within two to three months. The company is likely to have a 30 to 40% buy back agreement with the collaborator for five or ten years. But according to Mr. Balasubramaniam, the terms would depend on what the collaborator has to say.

About the investment pattern for the bulk drug project, he said that it would come from the company's internal resources, collaborator contribution and subsidy from the State Government for setting up the unit in a backward area. He also said that the Karnataka State Industrial Investment Development Corporation (KSIIDC) has offered its services to set up the unit in joint sector or it would have a small equity stake in the project.

Though the collaborator is allowed to pump in 40 per cent of the project cost, MBL is working out the equity pattern. Through the expansion, the company is projecting a total turnover of Rs. 25 crores in the first year of its operations. Mysore Breweries which registered a turnover of Rs. 15.65 crores during 1989-90 hopes to add only Rs. 2 crores this year though the production capacity is about 150 per cent. Seventy per cent of the beverages were exported to neighbouring states. About property development, he said that they have acquired about 50,000 sq. ft. of land in different parts of Bangalore. For this, the company has appointed a few civil engineers.

## MOBIL MAKES MAJOR GAS FIND OFF MEXICO

In a major discovery, Mobil Oil Corp. said that its producing well in the Gulf of Mexico flowed at 9,300 barrels of oil a day, the largest flow ever from a well penetrating a single zone in the Gulf. The Mobil exploration well, which began production recently, also yielded 14 million cubic feet of natural gas a day, the company said. The well is about 110 miles southeast of Galveston.

"Through application of sophisticated new seismic technologies, we gained a much better understanding of the geology of this mature producing area, which made this kind of result possible", said Mr. Charles Spruell, President of Mobil Exploration.

FOR MOST COMPETITIVE CIF OFFERS FOR:

**Epichlorohydrine**
**Thio Urea**
**Dichlone**
**and other Chemicals**

Please Contact:

**M/s. K. SANGHVI & CO.**

308, 'Gulab' 3rd Floor,
237, P.D 'Mello Road,
Bombay 400 001.

**Phone: Office: 2612232/2610711 Resi: 8128473/8226451**
**Telegram: KEYSANGHVI Telex: 11-73516 KSC IN**
**Fax No.: (22) 2618970**

# Alfa Drug project for intermediates

Mr. V.K. Garg of the Munak group jointly with the Punjab State Industrial Development Corporation (PSIDC), is setting up a Rs. 29-crore project for manufacture of vital drug intermediates for antibiotics.

Alpha Drug India Ltd., joint sector company of PSIDC and Mr. Garg, is setting up the plant in Patiala district of Punjab.

The company proposes to manufacture DPG chloride hydrochloride, Dane's salt and 3,4,5-trimethoxy benzaldehyde. All three are currently being imported.

Alpha Drug has tied up with Fuso Chemical Company Ltd., Osaka, Japan, for technical knowhow to produce trimethoxy benzaldehyde. It has also entered into an agreement with Chementenco S.R.L. of Italy for manufacture of Dane's salt and DPG.

According to Mr. Garg, chairman of Alpha Drug , the unique feature of the project is the technique of employing the pilot plant route to production process. The company has set up a pilot plant to test the suitability of local parameters and gain production experience. As a result, the company officials claim that there would be no problems in commencing commercial production. The project proposes to manufacture nearly 500 tonnes of drug intermediates per annum. This would include 40 tonnes of DPG, 200 and 60 tonnes of TMB and dane's salt, respectivelty.

PSIDC has decided to take up 26 per cent stake in the equity capital of the company, while the private promoters would subscribe to 25 per cent of equity. The balance is proposed to be offered to public.

The company's products as 100 per cent import substitutes are likely to cater to the increasing demands of the pharmaceutical industry in the country. According to industry estimates, the demand for ampicillin is projected to go up to 590 tonnes per annum by 1991-92. The demand for amoxycillin is projected at 121 tonnes and for cephalexin it is pegged at 123 tonnes per annum. According to Mr. Garg, the physical implementation of the project had commenced from April, 1989 and it is likely to start production by March 1991.

---

## UDAIPUR PHOSPHATES DOES WELL, STEPS UP DIVIDEND

Udaipur Phosphates & Fertilisers Ltd., has reported substantial improvement in financial results for the year ended March 31, 1990. The board of directors have recommended a divide of Rs. 2 per equity share, agai Rs. 1.60 per equity share for the p vious period (annualised). The equ dividend will absorb Rs. 33 lakh, sa a press release.

Turnover has increased Rs. 2,013.31 lakh, representing increase of over 38 per cent. Gro profit has gone up to Rs. 203.02 lak as compared to Rs. 144.82 lakh, shov ing an increase of 75.30 per cent (ann alised).

After providing for depreciation Rs. 54.12 lakh, taxation of Rs. 24 lak and writing off preliminary expenses Rs. 1.07 lakh, net profit available fo appropriation for the year is Rs. 12,59 lakh, against Rs. 73.25 lakh for the pre vious period, showing an increase o 113.5 per cent. (annualised).

The directors have transferred Rs. 3 lakh to investment allowance reserve Rs. 9.30 lakh to general reserve, an Rs. 8.00 lakh to debenture redemptio reserve, leaving a blance in the profi and loss account of Rs. 43.60 lakh.

The increased turnover and bette realisation of sulphuric acid sales hav contributed to improved profitability The directors have recommended bonu shares in the ratio of 1:3 to the equity shareholders, the release said.

Please Contact For Your Requirement of:

Carbon Tetrachloride

M.M. INDUSTRIES

432, Arun Chambers,
Tardeo Main Road,
Bombay-400 034.

Phones: 4938395
4949655
4949656

Authorised Dealer of M/s. NATIONAL RAYON CORPORATION LTD.

# SC Star Chemicals

FOR YOUR IMPORT REQUIREMENTS OF

**Pyridine**
**Theobromine**
**1-Methyl 6-Amino Urasil**
**CIMC Chloride**
**Propylene Glycol USP/Tech.**
**Epichlorohydrine**

**And for other Chemicals, Pharmaceuticals & Intermediates**

PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

MADRAS OFFICE:
D-4, 2/36 RAMS SQUARE
2, Village Road
MADRAS 600 034
**Tel: 864430/8250097**
**Tlx: 041 25164 STAR IN**
**FAX: 044 473762**

HYDERABAD OFFICE:
'NALANDA' Unit No. 7
6-3-649, Somajiguda
Hyderabad 500 482
Tel: 210288
**TLX: 0425-6131 STAR IN**

OUR LOCATION DOES NOT MAKE ANY DIFFERENCE TO OUR COMMITMENT TO SERVE YOU

TEST LABORATORIES

# PHDCCI asks BIS to get European accreditation

The PHD Chamber of Commerce and Industry has urged the Bureau of Indian Standards (BIS) to equip Indian test laboratories with modern equipment and arrange for their accreditation with European Community authorities so that the test certificates could be issued in India.

In a study undertaken by the Chamber on Industrial Standard Conformance testing and Quality Control in the context of EEC 1992, it has recommended that the product liability insurance scheme also be examined by the concerned authorities in India and suitable instructions be issued to insurance companies enabling them in making arrangements with their counterparts in Europe to issue product liability insurance to Indian exporters and manufacturers.

The study said that one of the main initiatives of the community is the launching of an European organisation for testing and certification. This organisation will be able to provide information, experience and a framework within which appropriate structures and agreements for the different industrial sectors could be negotiated. Widening of the scope of cooperation and initiation of sector-wise action was also suggested by PHDCCI. Some of the areas mentioned are automotive components and parts, domestic electrical appliances, processed food products, information technology, telecommunications, electronics, rural technology, prototype development centres, machine tools, energy, steel, medical and surgical equipment.

This would not only enable the Indian industry to develop products according to EC standards, to have an access to EC markets, but also elsewhere in the world. According to the Chamber study, a record number of technical committees have been set up to draw up European standards for community purposes. Several standardisation programmes have also been mandated.

It said although there would be a trend towards flexibility and universalisation, some member-States like the UK, FRG, France and Italy having a high level of standard will influence EC standards. Information on a draft standards is available on the integrated standardisation information system (ISIS) data base. All products which comply with these requirements will then carry the EC mark allowing them to be circulated in the rest of the Europ Community.

The study observed that under new approach, the manufacturers h a choice of specification to be app and the method of demonstrating c formity. The community safety po puts responsibilities on the manufac ers through product liability as w as obligations imposed on the s manufacturer by the technical legisl to ensure that certain preventive m sures are taken regardless of proc liability.

In case of imported products, pro liability has to be the responsibilit the local agency. This necessitates establishment of a relationship w large distribution agencies and es lishment of marketing companies, be in joint venture.

## PAPER MILLS ADOPTS NEW METHODS TO TREAT EFFLUENTS

For the first time in the country private sector Orient Paper Mill Brajarajnagar, 80 km from Sambal has successfully adopted a mo method of treating effluents by ' application and process'. Accordin management sources, the mill has so spent Rs. 1.10 crores of the Rs. crores project.

For Your Regular Requirements Of:

MANGANESE CHEMICALS

including

1. Manganese Sulphate Mono Hydrate Technical, Feed and Fertilizer Grades
2. Manganese Carbonate, Chloride. etc.

ZINC CHEMICALS

including Zinc Sulphate - Fertilizer and Feed Grades

Please Contact:

ANDAVAR CHEMICALS PVT. LTD.

26, 1st Cross Street, T.T.K. Road, Sreeram Nagar, Alwarpet, Madras 600 018.
Phone: 457280

NOW ON SALE

CHEMICAL WEEKLY BUYER'S GUIDE
EIGHTH EDITION (1989)

3 Volumes, pp. 1868

The most comprehensive survey on the Indian chemical industry to-date. Covering organic and inorganic chemicals, fine chemicals, bulk drugs, dyes, pesticides, fertilisers, paints, plastics, speciality chemicals etc.

Copies can be obtained from our offices in Bombay and Madras

Price Rs. 500 (Plus Rs. 75 for postage and handling; and Rs. 7 for outstation cheques) Payable in advance through cheque/demand draft/money order. No VPP please.

Contact

SEVAK PUBLICATIONS

**BOMBAY OFFICE:**
306, Shri Hanuman Industrial Estate,
G.D. Ambekar Road,
Wadala,
Bombay 400 031.
**Phones: 4131198, 4120743**
**Telex: 011-76053**

**MADRAS OFFICE:**
Room No. 9,
3rd Floor,
24, Commander-in-Chief Road,
Madras 600 105.
**Phones: C/o. 471659/419265**
**Telex: 41-6290**

INDIAN ORGANIC CHEMICALS LIMITED

LEADERS IN THE FIELD OF INDUSTRIAL CHEMICALS

*NOW AVAILABLE*
HIGH QUALITY

**GLYOXAL 40%**

For Pharmaceutical and Textile Auxiliary Manufacturers

ooo

OUR RANGE OF PRODUCTS

**Acid Group**

* Acetic Acid
* Acetic Anhydride
* Acetaldehyde

**Benzyl Products**

* Benzaldehyde
* Benzyl Acetate
* Benzyl Alcohol
* Benzyl Chloride

**Ester Solvents**

* Ethyl Acetate

**Plasticizers**

* DOP (Di-2-Ethyl Hexyl Phthalate)
* DBP (Di Butyl Phthalate)
* BBP (Benzyl Butyl Phthalate)
* DEP (Di Ethyl Phthalate)
* Other Phthalates

Manufactured by

**INDIAN ORGANIC CHEMICALS LIMITED**

Mehta Mahal, 15, Mathew Road,
BOMBAY - 400 004.
Gram: 'FUTURA' Bombay
Tel: 8111428-8112529-8113420
Telex: 011 - 75147 IOCL IN

FOR YOUR IMPORT REQUIREMENTS OF:

**GUM ROSIN**
(WW & WG GRADES)

**ORANGE OIL**
(Sweet Cold Pressed)
ex. Brazil

**D-LIMONENE**
(Natural) ex. Brazil

**LACTOSE I.P.**

**MONO ISOPROPYL-AMINE** (70% Aqueous & Min. 99% Pure)

**N-PROPYLAMINE**

**MONO-CYCLO-HEXYLAMINE**

**N-BUTYLAMINE**

**MONO ETHYL-AMINE**

**DI-ETHYLAMINE**

Please Contact:
AGENTS IN INDIA

soofi enterprises

1317, Dalamal Tower, 211, Nariman Point,
Bombay 400 021.
Tel. Nos.: 224689/233074
Tlx. No.: 0118-4187 SUFI IN
Cable: SOOFICHEM
Fax No.: 2047657

**PACKING BAGS:**
- HDPE BAGS
- JUTE BAGS PLAIN & LAMINATED
- LDPE/HMHD LINERS

**INDUSTRIAL CHEMICALS:**
- NITROBENZENE
- COPPER SULPHATE - ISI
- COPPER PHTHALOCYANINE (CRUDE)
- ALUMINIUM SULPHATE NON-FERRIC

Please Contact:

Mr. VASANT GIASOTTA
M/s. ANIL INDUSTRIAL SERVICES

Mr. ANIL GIASOTTA
M/s. INPAC

407, Jolly Bhavan No. 2, Executive Centre, 7 New Marine Lines, Bombay 400 020.
**Phones: 298583, 298991, 294348, 298992 & 250955**
**Telex: 011-4220 FIRE-IN & 011-MBSC IN**

ChemicoTour

**For Your Imports Of**

PANCREATIN
TARTARIC ACID
MONO SODIUM GLUTAMATE
GLUTAMIC ACID
LACTOSE BP/USP
EPHEDRINE HCl/PSEUDO
THEOPHYLLINE ANH. BP
8-CHLOROTHEOPHYLLINE
2-CYANO-4-NITRO ANILINE

SODIUM METAL
SULPHADIAZINE/DIOXINE
GUM ROSIN
GLYCERINE
ORANGE OIL
METHYL ETHYL KETONE
PROPYLENE GLYCOL USP
PARAFORMALDEHYDE
NAPHTHALENE CRUDE

BETA NAPHTHOL
SODIUM FORMATE
PHENOL BP/USP
BASIC CHROME SULPHATE
SODIUM BICHROMATE
MERCURY 99.99%
MICROCRYSTALLINE WAX
ACETYL CHLORIDE

Please contact for most competitive rates

**CHEMICOLOUR INDUSTRIES LIMITED**

302, T.V. Industrial Estate, Sudam Kalu Ahire Marg, Worli, Bombay 400 025.
**Telephone: 4933361/64 Gram: "KEMIKOLOR" Tlx.: 011-71223 CIL IN Fax: 4941612**

AVAILABLE FROM READY STOCKS

AMMONIUM CHLORIDE
BARIUM CHLORIDE
BARIUM CARBONATE
BARIUM PEROXIDE
BARIUM SULPHATE
MAGNESIUM CHLORIDE
MAGNESIUM SULPHATE
MAGNESIUM CARBONATE
MAGNESIUM OXIDE LIGHT HOLLAND

STRONTIUM CHLORIDE
STRONTIUM CARBONATE
STRONTIUM SULPHATE
STRONTIUM NITRATE
NICKEL SULPHATE 96%
METANILIC ACID
CASTOR OIL R.B. OIL
GILSONITE ROSIN
CALCIUM CHLORIDE 75%, 85%, 96% with Excise gate pass

PHTHALIC ANHYDRIDE
PROPYLENE GLYCOL
RESIST SALT
PARA PHENYLENE DIAMINE
MANGANESE CHLORIDE
MANGANESE SULPHATE 98%
MANGANESE ACETATE 98%
COPPER SULPHATE ISI
ZINC ACETATE 99.5%
BENZOYL PEROXIDE

Contact: **TRICO CHEMICALS**

C-29, 19th Road, Chembur, Bombay 400 071. Grams: TRICOGOLD Tel. No.: 5558265, 5557732, 4112934
DELHI R.K. GUPTAJI - 8920745

For Your Requirement of

DIMETHYL FORMAMIDE*

* (With MODVAT Benefit)

Please Contact:

**LEO DYE-CHEM**

79, V.V. Chandan Street, 3rd Floor,
Bombay 400 003.

**Tel.: 337125 / 336795 / 347930**

*Available*

SODIUM NITRITE
BLEACHING POWDER
BORAX & BORIC ACID
(Granular/Powder/Crystal Form)
CALCIUM CHLORIDE FUSED/SOLID
NICKEL CHLORIDE/SULPHATE

Please Contact:

**DIPPYS SALES PVT. LTD.**

*Regd. Office*: 230, Samuel Street, P.B. No. 3075, Bombay 400 003.
**Phones: 322571/323548/345701 * Telex: 011-76842 DIPY IN Grams: DIPPYS**

FOR YOUR REGULAR REQUIREMENTS:

* N-BUTANOL
* ETHYL ACETATE
* BUTYL ACETATE
* OCTYL STEARATE
* BUTYL STEARATE
* ACETONE
* I.P.A.
* D.E.G.
* M.E.G.
* OCTANOL
* TOLUENE
* BENZENE
* DIACETONE
* DIETHYL PHTHALATE
* DIETHYL OXALATE
* ACETYL CHLORIDE
* BENZOYL CHLORIDE
* BEZOYL PEROXIDE
* OXALIC ACID
* CALCIUM CARBONATE (ACTIVATED & PRECIPITATED GRADE)
* BORAX
* BORIC ACID (TECH.)
* TRICHLORO ETHYLENE
* ETHYLENE DICHLORIDE
* CITRIC ACID
* CAUSTIC SODA (FLAKES/LYE)
* TITANIUM DIOXIDE
* CYCLOHEXANONE
* POTASSIUM CARBONATE
* NITROBENZENE
* FORMALDEHYDE
* CARBON TETRACHLORIDE
* PROPYLENE GLYCOL
* STYRENE MONOMER
* PHENOL
* D.O.P.
* ACTIVATED CARBON

Contact

PATRON CORPORATION

2nd Floor, Gaekwad Chambers, Above Dena Bank, Chokhandi, Baroda 390 017. Tel.: 551880 Telex: 0175-447 MIE
A-5, Kewal Apartment, Near Maha Shiv Hotel, Old N.H. No. 8, Ankleshwar.

FOR YOUR REGULAR REQUIREMENTS OF:

**GLYCINE PURE/USP**
**HIPPURIC ACID**
**CALAMINE POWDER IP/BP**
**AMMONIUM CARBONATE**
**AMMONIUM CHLORIDE**

Please Contact Manufacturers

**M/s. FREZCO CORPORATION**

Shanti Nivas, 8th Road, Khar,
Bombay 400 052.

**Phone: Office: 6322847; Resi.: 6493549, 6484131**
**Telex: 011-79303 FC-IN**

Available

**META CHLORO ANILINE**

(Minimum Purity 99%)

For Local and Export

For further details please contact:

**Valiant Chemical Corporation**

For Local:
Mr. Arvind Chheda/Mr. H.L. Gala
5, Chheda Bhavan, 98, Surat Street,
Bombay 400 009
Phone: 863618, 862620, 8550745,
8555639, 8511698

For Export:
Mr. Manoj Chheda/Mr. Mahesh Vikam
Plot No. 74, Matru Smriti Road No. 4,
Scheme No. 6, Sion (East), Bombay 400 022.
Phone: 4072435, 4077431, 4077432, 4077433
Telex : 011-73254 ALAB IN
Fax : 022-4075524

MANUFACTURERS &
REPRESENTATIVE OF
INORGANIC AGRO CHEMICALS

* MANUFACTURE:
1. AMMONIUM NITRATE
2. POTASSIUM NITRATE
3. COCONUT SALT (Fert. use)

FOR MOST COMPETITIVE CIF
PRICE, PROMPT & REGULAR
DIRECT IMPORT FROM
USA/JAPAN/GERMANY/
CHINA/SPAIN/FRANCE

* STOCKISTS OF:
1. AMMONIUM BI-CARBONATE
2. BARIUM NITRATE
3. CAUSTIC SODA FLAKES/LYE
4. COPPER;SULPHATE
5. FERROUS SULPHATE
6. HYDRO
7. LITHARGE
8. METHANOL
9. METHYL AMINE
10. NITRIC ACID
11. PHENOL
12. SULPHURIC ACID
13. SODA ASH
14. SODIUM SULPHATE
15. SODIUM SULPHIDE
16. SODIUM NITRATE
17. T.G. UREA
18. TITANIUM DIOXIDE
19. TOLUENE
20. TRISODIUM PHOSPHATE
21. ZINC CHLORIDE
22. ZINC OXIXE

**THAKKER CHEMICALS**
**& FERTILIZERS PVT. LTD.**

* Registered Office:
307, 'NAVJIVAN', 3rd Floor,
121/127, Kazi Sayed Street,
Bombay - 400 003.
Tel. No. 336261/322719
Telex No. 11-75599 TCF IN

* Factory:
Plot No. 1712, GIDC IIIrd Phase.
P.O. VAPI, (GUJ) 396 195
Tel. No. Fact: 866 / Resi: 668

V.V.Trans
Investments
Private Limited
ANNOUCEMENT
EXCELLENCE
THROUGH
QUALITY
V. V. TRANS
Investments
Private Limited
ANNOUNCES
WITH PRIDE
THE COMMISSIONING
OF THEIR PLANT FOR
THE MANUFACTURE OF
CHLORINATED
PARAFFIN
WAX
(HNP / WAX BASED -
DIFFERENT GRADE)
FOR YOUR REQUIREMENTS
DEALERS/ACTUAL USERS
PLEASE CONTACT
M/s. V.V. TRANS
INVESTMENT
PRIVATE LIMITED
R.O. 43/262, New Sankalbagh
Narasinga Rao Pet,
Kurnool -- (A.P.)
Telephone: 21381
Telex: 0815-216

ATTENTION
EXPORTERS/INDENTORS/ACTUAL USERS
FOR YOUR REGULAR REQUIREMENTS OF:
OXALIC ACID
ORTHO ANISIDINE
FAST RED B BASE
FAST SCARLET R BASE
FAST BORDEAUX G.P. BASE
Please Contact Manufacturers
NANDOSAL INDUSTRIES

Factory:
Plot No. 4806 & 4807,
GIDC,
Ankleshwar 393 002.
Phone: 2882

Office:
7, Dharam Jyot
96, Kazi Sayed Street,
Bombay 400 003.
Phone: 339535

BP
MEKP
Jain
- BENZOYL PEROXIDE
- M.E.K. PEROXIDE
- T-BUTYL HYDROPEROXIDE
- T-BUTYL PER BENZOATE
- DI TERTIARY BUTYL PEROXIDE
- ALUMINIUM ISOPROXIDE

Contact Manufacturers
Jain & Jain
214/A JANJIKAR STREET
BOMBAY-400 003
PHONE:
323097 ● 321652 ● 328765
TBHP · TBPB · DTBP

## TECHNICAL GRADE PESTICIDES

# Plea for price monitoring

Pesticides formulators have stressed the need for urgently setting up a committee to monitor the prices technical grade pesticides with a view to stopping exploitation of small-scale formulators by a few multinationals.

Carbendazim technical during last year was available at Rs. 250 per kg, and immediately after the budget the price has gone up to Rs. 275. Similarly, the price of quinalphos technical has been increased by the manufacturers from Rs. 180 to Rs. 220 per kg according to Mr. Pradeep Dave, President of the Pesticides Formulators Association of India.

"Both these chemicals are manufactured by a few multinationals in the country and they have hiked the prices in spite of a reduction in the customs duty by 35 to 70 per cent in the budget", he added.

The government has lowered the customs duty to 70 per cent on some of the technical grade pesticides in the budget. He has suggested that other technical grade pesticides which are largely imported or are in short supply due to lower indigenous production, the customs duty should also be brought down to 70 per cent with a view to help formulators and farmers to get all pesticides at a reasonable price.

There are certain good pesticides such as chlorpyriphos, monocrotophos, methyl parathion, etc. which the farmers are unable to use because of the high customs duty of 105 per cent and they are forced to use BHC, malathion dimethoate, endosulfan, etc. which attract 70 per cent duty, resulting in excess use of formulations, he added.

The local manufacturers of technical grade pesticides are able to meet about 70 per cent of the local requirement and the balance (30 per cent) are imported.

---

## RALLIS TO MARKET FARM GROWTH PRODUCTS

Rallis India Ltd. Agro Division, has signed an all-India marketing and distribution agreement with Good Value Marketing Co. Ltd., recently for their GV System products: a new range of organic plant growth products.

This revolutionary Good Value System comprises of Buckup, bacterial organic manure for soil conditioning, Micrin, humus liquid for faster growth, Earthin, earthworm secretions for better quality fruits and vegetables and Leafax, fungus and insect-attack preventive spray. All these products are non-toxic and made from natural organic materials. The GV System counteracts the ill-effects of chemical fertilisers and agro chemcials. Farm pollution, soil spoilage, reduced keeping-quality of the produce, and toxic residues in food ar effectively dealt with the GV System Buck up is applied to the soil to replenish the beneficial soil flora; Micrin Earthin and Leafax are folior sprays t give catalytic inputs for impressive cro growth.

The GV System products have been tested for their efficacy in sugarcane agriculture by the Vasantdada Sugar Institute (formely the Deccan Sugar Institute) under the guidance of the famous bio-scientist, Dr. D.G. Hapase.

While the control plot (with the normal dose of farm-yard manure) showed an yield of 94.19 tonnes/hectare, with the application of Buckup 40 Kg/hectare it increased to 124.68 tonnes/hectare (+32%), with Buckup and Micrin spray 5 lit/hectare, it increased to 134.38 tonne/hectare (+42%) and with Buckup, Micrin and Earthin spray 5 litre/hectare it further increased to 146.38 tonnes/hectare (+55 per cent).

Looking for a REACTION VESSEL?
Here's the CLUE!
Requisition the exceptional
inertness of CARBON
to work for you in the
HIGHLY CORROSIVE
Elevated Temperature Duty.
Also, if required, with good
HEAT TRANSFER.
TRY modtech BCARB - A1
CARBON TILE LINED MS VESSEL
a LOW COST alternative to
SS OR GL
REACTION VESSELS

BLAST CARBOBLOCKS
Private Limited
224, Vardhman Chambers, Sector 17, Vashi,
New Bombay-400 705
Tel: STD-0215-681279

# Formulators opposed to changes in pesticides act

The proposed amendments in the Central Insecticides Act is being strongly opposed by Indian pesticide formulators.

They are of the view that the amendments will provide protection to multinationals manufacturing pesticides in India. This is because, under the proposed provision, no company will be allowed to manufacture a product registered with the Central Insecticides Board by a particular company for a minimum period of five years. In other words, the first company will have a monopoly in the production of that product for five years.

Presently, the Board allows repeat registration of a product which is already in production. This means any number of companies can manufacture a product originally registered by a particular company. According to manufacturers, this system provides enough competition and thereby brings down the price. This also enables Indian companies to develop technology and manufacture the product at low cost.

However, the proposed amendments will completely eliminate competition in the market and the product will be priced high. As such multinationals are charging very high price for the technical grades used for making formulations. The Bureau of Industrial Costs and Prices (BICP) is currently studying the price of various types of technical grade pesticides following the representations from the formulators.

According to the Pesticides Formulators Association of India (PFAI) the proposed amendments in the Insecticides Act is "backdoor introduction" of Patent Act in India. For the last several years multinationals have been trying in vain to make the Indian Government sign the Paris convention which will provide patent protection for products up to a period of 20 years. Now they are exploring other avenues where they can have monopoly operations in India.

The PFAI president, Mr. Pradeep P. Dave, told newsmen recently that the proposal to amend the Act had come up following pressures from the strong MNC lobby which has vested interest in getting the Act amended.

According to him, most of the drug MNCs, are also in pesticides and in India they are not able to make huge profit in drugs due to the price control. What they are trying to do now is to make up this by having monopoly in pesticides market.

---

## KARNATAKA YET TO DECIDE ON MCF TAKEOVER

The Karnataka Government is likely to clear the way for the UB group takeover of Mangalore Chemicals and Fertilisers (MFC) only after getting the clearance from all the financial institutions and banks concerned.

According to sources in UB group, the Industrial Development Bank of India (IDBI) is reported to have sent its approval to the State Government on July 19. Now, it is the turn of the banks to pave the way for the State Government to hand over the company.

It may be recalled that the UB group had negotiations with the financial institutions and banks in Bombay on July 16 to discuss the proposed rehabilitation package for MFC.

On July 20, the State, Parliamentary Affairs Minister, Mr. Veerappa Moily, told newsmen that the State Government is yet to take a decision in this regard as a lot of formalities were to be completed.

However, he was hopeful that the deal would be completed soon as t company was incurring a loss of Rs. crores every month. When asked wh Rashtriya Chemicals and Fertilise (RCF) offer was not taken into consi eration, he said RCF could not g clearance from the Centre for takin over the State Government was happ to hand it over. The revival package wa only at the proposal stage, he said.

The State Industries and Commerc Secretary, Mr. B.S. Patil, said that final position about the acquisitio would emerge only when the banks an financial institutions pave the way fo the State Government.

---

## INDIA SUPPLIES $2.6 M POL T NEPAL

India had supplied petroleum oil lub ricants (POL) to Nepal by March 2 1989 worth $ 2.6 million U.S. dolla which was more than what had actuall been paid for.

Refuting an allegation by a section o the Nepali press that Indian Oil Cor poartion had suspended supplies of PO products to Nepal on March 23, 198 despite an agreement with the Nepal O Corporation, an Indian embassy pres release clarified the previous agreeme between the two corporations had ru its full term of five years before i expired on March 31, 1989.

The press release aslo dismisse reports that the NOC was considerin claiming compensations for the allege discontinuance of supplies from March 23, 1989, and said even by that date th NOC had obtained supplies of POL worth U.S. $ 2.96 million-more tha what it had actually been paid for.

Moreover, the press release said, the IOC supplies during 1988-89 was 6 pe cent more than what the NOC had projected. "Thus there is no qustion of any failure on the part of IOC to fulfil its contractual obligations to NOC, it said.

## 2ND ACHARYA P.C. RAY MEMORIAL LECTURE:

# Importance of Oleochemical Industry stressed

Delivering the Key-note address at the 2nd Acharya P.C. Ray memorial lecture, Prof. M.M. Chakrabarty, ex-Vice Chancellor of Jadavpur University and presently Adviser to the UGC Centre of Advanced Studies on Natural Products, Calcutta University, identified different usages of oil and fats for the manufacture of oleochemical items which have great potential for export as well as to cater to the needs of indigenous demand.

Prof. Chakrabarty identified hydrocarbon prepared by decarboxylation of fatty acids, methyl esters of vegetable oils, prepared by reacting of palm oil with methanol which could yield glycerine in concentrated form and blend of oils and ester as processess worthy of investigation.

While informing that the oleochemicals being produced from oil and fats could replace petrochemical fuels and reduce the pressure of natural resources, he informed, that India has vast potential for promotion of export efforts of oleochemicals without importing the feedstock as was being done at present from different countries. He informed that the world production of Fatty Acids, the main input for oleochemicals, is estimated at 2351000 tonnes against 641000 tonnes in 1982. He estimated that the rise will be to the tune of 326000 tonnes by 2000 A.D. India's total consumption of fatty acids, he informed, was placed at 2.1 lakh tonnes of which the domestic production was about 1.65 lakh tons, the balance being imported. He suggested that through concerted planning of oleochemical sector to remove shortage of vegetables and other oils like rice bran oil or cotton seed oil, the present production could be doubled to mitigate the demand supply gap and to enable India to have exportage surplus. Prof. Chakrabarty referred to several foreign experts like Rudolf Diesel, who had successfully used vegetable oils instead of diesel to operate mortos. Prof. Chakrabarty estimated that about 8 lakh tones of oil can be obtained from subsidiary sources like rice bran oil and cotton seed oil in India. But this potential has not been fully harnessed and utilised. He felt that oleochemicals were already replacing hydrocarbon and petrochemicals and ICMA should give serious through to recommend to Government of India for a strategic planning.

Earlier, Mr. Atmaram Saraogi, President, ICMA gave an account of Acharya P.C. Ray the founder President of the Association and stressed the need for comprehensive growth policy for chemical industry. Mr. Saraogi informed that this industry having been contributed 30% of industrial output to Indian economy in terms of CDP and being one of the highest growth oriented in respect of exports since last two years, Govt. of India should be serious towards the promotional and developmental needs of this sector as this holds very promising future for export-led growth of Indian economy.

He suggested the formation of high level policy coordinating machinery together with concerned department of Govenmment involving the accredated representatives of chemical industry to continuously monitor the growth trend of this sector.

He stressed that if India has to succeed in the development of oleochemicals, the Government has to formulate a long range policy to tackle fat shortage which is the main input for oleochemicals.

Mr. O.P. Malhotra, Chairman, Eastern Region, ICMA, moved the Vote of Thanks on behalf of Board of Trustees and ICMA. The meeting was attended by a cross section of people from Industry, Government, new entreprenuers and media etc.

---

## FLAT TAPE MAKERS HIT OUT AT IJMA SUGGESTION

The All-India Flat Tape Manufacturers Association (AIFTMA) has found the suggestion of the Indian Jute Mills Association (IJMA) regarding differential rate of duty for cement units using agro-based packaging materials like jute unjustified.

Reacting to the suggestion, the President of AIFTMA, Mr. Tikam Patni, said the Government was going to any extent to destroy the plastic woven sacks industry. In a strongly worded statement the AIFTMA President said that the Government must realise that the price differential of the bags is not only reason that forces the cement industry to use HDPE bags increasingly.

The actual reason, he said was because the cement manufacturers found HDPE bags more acceptable to the consumers. He urged the Government to do away with any suggestion for differential rate of excise duty for cement packed in jute and/or HDPE bags it would go against the declared policy of fair trade practice and free competition.

---

## JAGSON TIE-UP WITH U.K. CO. FOR OIL DRILLING

Jagson International Ltd. has entered into a technical agreement with the British group, BPB Instruments Ltd., for electrologging and perforation technologies in oil drilling operations. According to a company release, these two are highly sophisticated technical areas upon whose accuracy depends the success of oil finds. According to the release, Jagson has also entered into a technical-collaboration with a Dutch company, Petroplog, for offering mud engineering technology, which is also a crucial acitivity in oil exploration business.

## PROPYLENE, CATALYTIC REFORMER UNIT AT MATHURA

# IOC gets eco clearance

Decks have been cleared for the Indian Oil Corporation (IOC) to set up facilities for production of propylene and a catalytic reformer unit at Mathura. The environment and forest ministry has cleared the proposal of the corporation for production of 24,000 tonnes per year of propylene, 12,500 tonnes of isobutylene and a 45,000 tonne catalytic reformer unit at the Mathura refinery. The proposal had been pending with the ministry since May 1989.

The products will be supplied to the Pradeshia Industrial Development Corporation of Uttar Pradesh (PICUP) for manufacture of downstream petrochemicals. The proposal has been cleared subject to certain conditions to ensure that the Taj Mahal is not affected by any increase in emissions from the Mathura Refinery.

It has been stipulated that at no time the sulphur dioxide emission from the various units should exceed 1,000 kg per hour which is the prescribed safe limit for protecting the Taj Mahal. The rapid environment impact assessment (EIA) report has shown that the sulphur dioxide ($SO_2$) emission levels at the refinery from their stacks vary from 500 to 720 kg per hour against the permissible rate of 1,000 kg per hour. The total quantum of additional fuel oil which results in sulphur dioxide emission of 62 kg per hour would be 84 tonnes a day.

Since the maximum impact zone lies in the south-east direction, the development of a green belt around the refinery has been proposed. The ministry has stipulated that the density of the existing plantations should be doubled, particularly in the south-east direction at the plant with suitable plant species and the green belt development plan as suggested by the consultants should be strictly followed.

The ministry has laid down that the LPG requirement of the surrounding districts shall not be affected due to the proposed product diversification. The project authority will utilise the treated effluents to the extent of 65 per cent either as a process water or for agriculture or afforestation purposes. Proper control of hydrocarbons emission should be ensured during the start up period of any unit. Standby sulphur recovery unit should always be kept in operation so that excess sulphur dioxide emissions can be avoided.

The project authorities have also been asked to monitor and control other fugitive emission from existing and new storage tanks. The ministry has also stipulated that the project authorities will not be permitted to exceed 7.5 million tonnes per annum throughp capacity at the Mathura Refinery.

## CHEMEXCIL'S EXPORT TARGET AT Rs. 2,900 CRORE

The Basic Chemicals, Pharmaceut cals & Cosmetics Export Promotic Council (CHEMEXCIL) has set th target at Rs. 2,900 crores — 50 per ce increase over the previous year — fo exports in 1990-91 by its member unit The exports grew four-fold — fro Rs. 478 crores in 1985-86 to t Rs. 2,118 crores in 1989-90, accordin to Mr. Ramu Deora, CHEMEXCI chairman. He was addressing the silve jubilee celebrations of CHEMEXCIL a Bombay.

Mr. C. Subrahmaniam, Governor o Maharashtra, who was the chief gues at the function, presented the CHEMEXCIL's awards for excellence i exports. Trishul awards were won b Ranbaxy (large unit) and G. Amphra Laboratories (small unit); and to awards by Jaysynth Dyechem (larg unit) and Bharat Industrial Corpr (small unit).

The CHEMEXCIL chairman urge the Governor to persuade the Maharashtra government to exempt raw materials of pharmaceuticals being produce for export from octroi duty. Further, h pleaded for according a "green channel" treatment at the Bombay port fo export cargoes.

DYESTUFF EXPORTERS!
FOR YOUR REQUIREMENTS OF:

**REACTIVE YELLOW 15/17/37/42/81/84**
**REACTIVE ORANGE 4/12/13/16/84/94**
**REACTIVE BLUE 21/25/71/140/171**

SHORTLY INTRODUCING

**SPRAY DRIED DYESTUFF**

For your requirements please contact:

**SHYAM DYE CHEM**

36, Maker Chambers VI, Nariman Point, Bombay 400 021.
Telex: 011-84285/84290/84296 DEC IN Fax No.: 202 4129
Tel. No.: Office: 2872111/2872112 287981 (8 lines) Resi.: 6261728 (DINESH L. THAKKER)

### INET SENDS PROPOSAL BACK TO FINANCE MINISTRY

## ndla-Bhatinda pipeline delayed further

a decision that has far-reaching ications, the Union Cabinet has red the proposal for setting up the lla-Bhatinda petroleum products line project back to the Finance stry. The Cabinet examined the osal a few days ago. It took note he persisting differences among sters, over the need for the pipeline ect, and hence directed the Finance istry to call a meeting of ministries differed over the project so as to ve at a decision.

he Cabinet's move will inevitably ve the inter-ministerial war over ing up this key project, which eared to have ended after the ance Ministry cleared the project in il last and sent it to the Cabinet. th the Finance Ministry now holding neeting of the ministries concerned, re is bound to be a fresh review of project and arguments against it and favour of it will once again be exaned.

This is certain to delay the project ther and jack up its cost. It is already layed by over two years and the cost the 1,330 kilometre long pipeline prot has shot up from the original estiate of Rs. 650 crores to Rs. 917 ores.

In addition, the Indian Oil Corporan (IOC), which will implement the oject, will continue to cough up 2,000 per month as commitment arges for its failure to utilise the loan had negotiated with the World Bank. he total amount of the negotiated loan $350 million, but of this only $178 illion is for the Kandla-Bhatinda pipene project and the rest is for other procts to be implemented by IOC.

The delay has in fact upset all project cost calculations as even the forign exchange component of the project ost has now escalated from Rs. 155 crores originally to Rs. 205 crores now. The ministries quarrelling over the project are, the Petroleum and Chemicals Ministry, Railways Ministry and the Defence Ministry, which joined the battle recently. The Planning Commission also has played a significant role in contributing to the inter-ministerial battle.

While the Petroleum and Chemicals Ministry wants the pipeline project to be set up by IOC a public sector unit under its administrative charge, the Railways Ministry feel that the government should not allow the project, since it would erode the viability of a railway line project planned to the same Kandla-Bhatinda sector.

The Defence Ministry, which joined the fray a little later, argued in favour of the railway line on strategic considerations and put pressure on the government to complete the railway project fast so that a viable multi-purpose transportation network could be established on this sensitive sector, much of which runs parellel to the Indo-Pakistan border.

There were, however, no such signs of differences of perception over the project when it was mooted by IOC. A detailed economic analysis was carried out by the projects appraisal division of the Planning Commission. The analysis showed that the capital cost of the pipeline would be Rs. 610 crores, while that of the railway system on the same sector would be Rs. 948 crores.

In the light of this analysis, the Public Investment Board (PIB), an interministerial body, recommended the project at a meeting in January 1989. Two months later, IOC negotiated the loan with the World Bank and signed the agreement on September 11, 1989, as part of its advance action for timely execution of the pipeline project.

But the Finance Ministry could not clear the project and send it to the Cabinet as the previous Railways Minister, Mr. Madhavrao Scindia, opposed the project on the ground that a railway line already being constructed on that route could adequately meet the requirement of carrying petroleum products.

The previous Planning Minister, Mr. Madhavsinh Solanki, also opposed the project and even sought the intervention of the previous Prime Minister. Hectic lobbying followed. The Petroleum Ministry argued that while the delay had threatened to disrupt plans to meet the large demand for petroleum demands in the north-west region, the economic cost of transportation by rail was 2.5 times that of the proposed pipeline.

After the National Front formed its government, the controversy continued till the then Planning Commission Deputy Chairman, Mr. R.K. Hegde put an end to the debate and recommended its presentation before the Cabinet, since PIB had already cleared it.

Subsequently, the Finance Ministry sent the project to the Cabinet in April 1990, raising hopes of an early clearance for the already delayed project.

But with the Cabinet returning the project to the Finance Ministry, IOC may well have to wait for some more weeks before the project gets the final seal of approval. The Finance Ministry is yet to fix on the date for the meeting of representatives of Petroleum and Railway Ministries.

### PROTOCOL ON COAL SIGNED

India and the Soviet Union signed a protocol on coal after reviewing their long-term programme of co-operation valid upto 2000 AD. According to official sources, the protocol was signed by Mr. R.C. Jain, secretary of coal, Ministry of energy, and Mr. A.G. Korkin, first deputy minister of coal industry of the USSR, at New Delhi.

# Gas cracker commissioned

The Maharashtra gas cracker, of Indian Petrochemicals Corporation Ltd. (IPCL) has been commissioned. The commissioning of the cracker, which has been considerably delayed owing to various reasons, including the non-availability of feedstock, has been achieved with temporary supply of LPG by the Oil and Natural Gas Commission (ONGC).

According to the petroleum and chemicals minister, Mr. M. S. Gurupadaswamy, the commissioning of the cracker plant will decrease import dependence and save the country about Rs. 240 million per annum.

Estimated to cost Rs. 1,390 crores, the gas cracker is the mother unit of Maharashtra Gas Cracker Complex (MGCC).

The complex is designed to produce 2.75 lakh tonnes per annum of polymers like low density polyethylene (LDPE), linear low density polyethylene (LLDPE), high density polyethylene (HDPE) and polypropylene.

It will also produce 50,000 tonnes per annum of MEG — a raw material for polyester industry and 25,000 tonnes per annum of wire and cable compounds mainly for telecommunication and power sector.

The polypropylene project of the complex has already been commissioned in April 1989. The LDPE and MEG plants are also ready for commissioning. The LLDPE plant is expected to be ready from October 1990 in two phases.

Located on a 938 hectare site at Nagothane in Maharashtra, the MGCC complex will be fed by 4.50 lakh tonnes per annum of ethane and propane from the ONGC at Uran and 51,000 tonnes per annum of propane and prop
from the Bharat Petroleum Corpor
Ltd. (BPCL). These feedstocks w
transported through two pipelines
ling to a length of 74 kms. Other n
inputs for the complex include 15
lion gallons a day of raw water ar
MW of power from a gas-based ca
power plant with 15 MW bac
power from the Maharashtra State
tricity Board.

The Rs. 1,390-crore MGCC com
has been financed entirely out of IP
internal resources and external bor
ings. It does not involve budgetary
port from the Government of I
except for rerouting of the $210 mi
loan from the World Bank.

IPCL also plans to expand the cra
capacity from 300,000 to 400
tonnes of ethylene with correspon
expansion of downstream units fo
manufacture of LLDPE and HI
With the successful completion o
first gas cracker plant by it, IPCL
now take up implementation of anc
gas cracker — the Gandhar Petroch
ical Complex in Bharuch in Guj
The project is likely to materi
during the Eighth Plan.

AVAILABLE

CONC: **NITRIC ACID (98.5%)**
**FORMIC ACID (85%)**

Manufactured by:

GUJARAT NARMADA FERTILIZER CO. LTD.

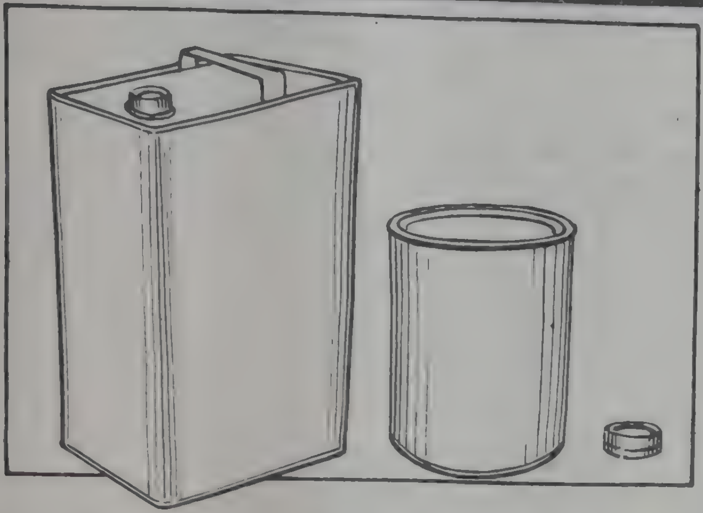
CONTACT FOR YOUR REQUIREMENTS:

**CHEMOX CHEMICAL INDUSTRIES LTD.**
Pooran Asha Building, 317, Narsi Natha Street, Bombay-400 009.
Phone: 335061 (10 LINES) Gram: INCHEMOX
Telex: 11-76723 CHMX IN Fax: 91-22-855 89 38

## NAPHTHA ON PRIORITY BA
## TO HALDIA

The Centre has decided to earn
supply of naphtha on a priority basi
use in the Haldia petrochemical pro
Mr. Jyoti Basu, West Bengal C
Minister told newsmen on July 18,
the Union Petroleum Ministry
informed the State Government tha
Haldia project's requirement of a
lion tonnes of naphtha per year w
get precedence over other project
the grounds that it had suffered
delays for no fault of the State Gov
ment. Terming his discussions with
Petroleum Minister, Mr. Gurupa
wamy as "very positive", the C
Minister said the State would expen
least Rs. 100 crore in executing the
ject in the current year.

TIN CONTAINERS



MFGS.

- Round & Rectangular Cans
- P.P. Caps & Neuman Caps
- Advt. Metal Posters
- Components & Drum seals

卐 SWASTIK INDUSTRIES

34/C, Thakker Building, Ground Floor, Gala No. 4, Champsi Bhimji Rd., Next
to Shrinivas Bldg., New Post Office, Old Anjirwadi Mazagaon,
Bombay-400 010. Ph: 8729366.

FOR YOUR IMPORTS AT COMPETITIVE CIF PRICES

Aniline Oil
Benzaldehyde
Beta Naphthol
Bis Phenol A
Cyclohexanone
2-Ethyl Hexanol
Gum Rosin
M.E.K.
N-Propanol
N-Acetyl Sulphanilyl Chloride
Phthalic Anhydride
Sodium Nitrite

Please Contact For Further Details:

M/s. OCEAN TRADING CORPORATION

329, A to Z Industrial Estate, G. Kadam Marg, (Ferguson Road),
Lower Parel, Bombay 13.
Phone: 4921664/4921669/4921711 Telex: 011 71564 DAYA IN

# APPOINTMENTS/CLASSIFIED

## WANTED

## DISTRIBUTORS/ COMMISSION AGENTS

A LEADING MANUFACTURER OF PLASTICS ADDITIVES NEEDS DISTRIBUTORS/COMMISSION AGENTS FOR NORTHERN AND GUJARAT REGIONS.

INTERESTED PARTIES MAY PLEASE CONTACT

**Box No. 1256**
**CHEMICAL WEEKLY**
306, Shri Hanuman Industrial Estate,
G.D. Ambekar Road, Wadala, Bombay 400 031.

## FACTORY FOR SAL

A chemical/dyes small scale un located at Tarapur is available fo sale. Total land area is 800 sq. m Built-up area 3000 sq. ft. Machiner and utilities in excellent workin conditions.

Interested parties contact at

**Box No. 1255**
**CHEMICAL WEEKLY**
306, Shri Hanuman Industrial Estate,
G.D. Ambekar Road, Wadala,
Bombay - 400 031.

## BULK DRUG UNIT FOR SALE/LONG TERM LEASE

NEW BRAND BULK DRUG UNIT FOR OUT RIGHT SALE/LONG TERM LEASE.
WITH ALL INFRASTRUCTURAL FACILITIES.

LOCATION: NEARBY HYDERABAD, BUT IN KARNATAKA STATE.

LICENCES: FROM ALL CONCERNED DEPARTMENTS

UTILITIES: ALL

LIABILITIES: NIL

ANY BULK DRUGS OR INTERMEDIATES CAN BE MANUFACTURED WITH 100 MT/YEAR CAPACITY MINIMUM ALL BACKWARD AREA BENEFITS AVAILABLE.

CONTACT IMMEDIATELY

**Box No. 1258**
**CHEMICAL WEEKLY**
306, Shri Hanuman Industrial Estate,
G.D. Ambekar Road, Wadala, Bombay 400 031.

This space
will cost you
Rs. 1000 only

# BULK DRUG DISTRIBUTORS WANTED

We are a multi-crore, bulk-drug manufacturing company. We have set up ultra-modern and fully automatic facilities conforming to US-FDA guidelines, with a total investment of Rs.7 crores to produce Ibuprofen. Our expansion plans, undertaken with an additional investment of Rs.20 crores, envisage introduction of many traditional and new bulk drugs in the next one year.

We require distributors to represent us in all major markets of the country. Applications should provide the following details

- financial background
- markets covered, names of major consumers and indication of the annual offtake of Ibuprofen
- experience in selling to the pharmaceutical industry
- bank references.

Parties able to furnish deposits / bank guarantees shall receive preference.

Applications should be mailed within a week of this advertisement to :

The General Manager – Marketing

SPCL

**Sumitra Pharmaceuticals & Chemicals Ltd.,**
508, Raghava Ratna Towers, Chirag Ali Lane, Hyderabad 500 001
Phone : 241719 / 242356 Telex : 0425-2152 SPCL IN Fax : 0842-233901

# Experts find fault with WB gas report

The recent World Bank note on "Evaluation of India's oil and gas production potential", faulting agencies like ONGC for poor reservoir management and low success ratio for exploration of wells, has been questioned by a number of experts.

Senior engineers from the Institute of Reservoir Studies (IRS), Ahmedabad and top geo-scientists from Bombay off-shore projects are of the view that the points raised by the report do not have much basis as they differ from the actual results obtained in various fields. They also point out that the terms of reference and source of information of the report are not known.

The geo-scientists say there is practically no loss in oil recovery, as alleged by the World Bank report. They point out that the cumulative oil production at Bombay High North and South upto March 31, this year has been 67.6 and 101.1 million metric tons (MMT) respectively, this compares with 67.7 MMT and 98.6 MMT envisaged for the projects in the scheme of exploitation.

The report blames ONGC for a low success ratio of commercial discoveries versus the number of wells explored. It goes on to say that the ratio is way below the international average. This is contrary to the actual results. Petroleum ministry sources point out that the success ratio, as per the AAPG (American Association of Petroleum Geologists) nomenclature, for India is 1:3 against 1:6, which is the international average.

The total number of wells drilled in India during 1980-89 was 344, out of which 110 have been hydrocarbon bearing. This compares with the USA where of the 3,716 well drilled, only 506 have emerged as hydrocarbon bearing.

On the allegation that efforts to maintain pressure in the wells was inadequate, the engineers from IRS contend that the present reservoir development strategy was ratified jointly by ONGC and CFP (Companie Francaise de Petrol).

But they add, only following the advice of the foreign consultants for peripheral water injection, which refers to drilling of water well outside the periphery of the oil field, would have rendered the wells useless as irrecoverable losses would have occured.

They say that ONGC uses different methods for enhancing oil recovery and this includes gas lifts and also in field drilling, where an oil bearing well is drilled in between two oil wells.

What has also been surprising to many is the fact that the World Bank itself had, some time ago, praised ONGC and declared the Bombay High offshore development to be an 'unqualified success'.

In this appraisal report, the bank had adjudged ONGC to be "a technically and administratively competent organisation which makes judicious use of consultants, effective recruitment and training practices and actual involvement in all factors of offshore petroleum technology.

There are even murmurs that the critical nature of the report has been instigated by refusal by ONGC's refusal to utilise the services of one of the team members as a consultant.

---

## ONGC TO GO FOR RABMN

The Oil and Natural Gas Commission (ONGC) is planning to upgrade its Opsprint network by remote area business message network (RABMN).

The RABMN will cover various ONGC stations such as Bombay, Madras, Calcutta, Nazira (in Assam), Baroda, Jorhat, Silchar and Rajamundhry, among others. Opsprint network provides teleprinter facility between the ONGC's corporate he
quarters at New Delhi, Dehradun
other regions. Under its upgradat
plan, very small aperture termi
(VSATs) will replace store and forw
telegraphs (SFTs) of Opsprint netw
The ONGC will use SFTs for in
regional communication. At pres
Delhi, Dehradun and Bombay are m
SFT centres.

The Department of Telecommuni
tions (DoT) has to instal a hub at Sec
derabad for RABMN. The DoT is
to receive hardware (up/down conv
tors) required for this hub.

Originally, upgradation of Opspr
network by RABMN was part of
Seventh Plan Communication netw
of the ONGC. Now it will form part
the Eighth Plan communication 'n
work. The RABMN is likely to
commissioned in the next six mont
time.

The RABMN is a satellite ba
network for transmission of data, f
simile and telex messages. The acc
to the network can be had through mi
earth terminals installed at custome
premises.

The ONGC is planning for other s
tems such as area surveillance syst
for Uran at a cost of Rs. 2 crores, to
completed by June '92, computer n
working costing Rs. 75 lakhs by Ma
1992, and enhancement of HF ra
network for drilling rigs to be comple
by June 1991.

The ONGC has installed access c
trol system at Uran for monitor
movement of employees and the labo
at a cost of Rs. 28 lakhs. This syst
also keeps tabs on the movemnet
security guards posted at the gates

It uses Wiegand cards which
inserted in the gates and the compu
gives command on matching co
This system can detect unauthori
tampering with gates.

AVAILABLE

SPECIALITY BINDER
FOR
BRASSO PRINTING

ALSO OTHER BINDERS FOR
PRINTING, DYEING, NONWOVENS,
FLOCK ETC.

Contact

**BOX NO. 1259**

**CHEMICAL WEEKLY**
306, Shri Hanuman Industrial Estate,
G.D. Ambekar Road, Wadala,
Bombay 400 031.

ATTENTION ACTUAL USERS/EXPORTERS
FOR YOUR REGULAR BULK REQUIREMENTS OF

SUPER WHITE : SUPER QUALITY

ORTHO TOLUIC ACID

WITH MODVAT FACILITIES

Please Contact:

**RAVI CHEMICAL WORKS**

Plot No. 41/1/28 & 47/1/29 GIDC Industrial Estate,
Nandesari 391 340. Dist. Baroda.

**Phone: Works: 60472**
**Resi.: 320986 Baroda**

BOOKS
FOR YOU

**Cosmatics and toiletary formulation**
by Flick. '89 Edition Rs. 2,300/

**Handbook of Maintenance Management**
by Herbatly. '89 Edition
Rs. 1,175/-

**Oil Spill Response Guide**
by Robert Mogerd & Research
Planning inst Rs. 825/-

**The Chemical Laboratory, its Designs & Operation**
by Signad Rosoulud. Rs. 660/-

**Industrial Surfactants**
by Flick. Rs. 1,575/-

**Chemical Guide to the United States. 1989/90**
by De Renzo.
Listing 220 Companies having
turnover of over $ 10 Million with
details ot ownership/subsidies,
Affiliations, Sales, Plant locations
Address & Telephone Nos.
Rs. 1775/-

POSTAGE/DELIVERY
FREE

CASH WITH ORDER

M. M. MUKHI & SONS
P.O. BOX 905,
140, D. N. ROAD,
BOMBAY-400 001
TEL: 2049787

Lotus Publicity

# Gujarat units to fight ONGC

Natural gas-consuming industries in Gujarat are preparing to mobilise public opinion to take up cudgels against the Oil and Natural Gas Commission (ONGC) for arbitrary fixation of gas price in view of the supreme court's verdict in its favour.

As per the Supreme Court's judgement delivered on May 1, the ONGC's right to fix the prices of its produce has been accepted according to which each of the 20 litigant parties in the state would be required to pay natural gas price at the rate of Rs. 2,503 per 1,000 cubic metres as against the Rs. 1,000 per 1,000 cubic metre price fixed by the Gujarat high court earlier.

With the judgment having retrospective effect from 1982, the arrears according to the new price rate on the 20 units amount to more than Rs. 110 crores. If there is no change in the situation and the ONGC start recovering the arrears, the only alternative, for most of the 20 units would be to close down, rendering thousands of workers jobless, said Mr. M.H. Thakkar, secretary of the association of natural gas-consuming industries, formed by 20 gas users in the state. He told newsmen recently that 20 units together had more than 30,000 work force.

The press conference was attended by representatives of the Bharatiya Mazdoor Sangh, the Hind Mazdoor Sangh, the Indian National Trade Union Congress, the All-India Trade Union Congress and the Majoor Mahajan, the trade union bodies of the employees in these industries. Among the parties affected by the judgment was the Baroda municipal corporation which was supplying gas through the pipeline to the domestic users for cooking purposes.

Besides filling a review petition, the association will also file a public litigation petition in the supreme co
soon since a large section of peop
would be affected by the unilateral pri
fixation by the ONGC. In addition,
might also mobilise members of Par
ament to press the Centre as well as t
state government to reconsider the s
uation, since the chief minister, M
Chimanbhai Patel, has supported t
cause of the gas-consuming industri
in the state. A signature campaig
would also be launched and if all the
measures failed, the association with t
help of the trade union bodies wou
launch a popular agitation against t
ONGC. Mr. Thakkar said it was a pi
that the ONGC was refusing to supp
gas at a reasonable price to the consum
ers when it was flaring up near
Rs. 1,800 crores worth of natural g
per annum for want of takers. He argue
that the ONGC's claim of gas price c
coal equivalent and thermal efficienc
was unjustified, particularly when it ha
failed to furnish, even the cost of pr
duction of natural gas.

| | |
|---|---|
| **PETROLEUM ETHER 40°-60°*** | **German** |
| **POTASSIUM CARBONATE*** | **France** |
| **EPICHLOROHYDRINE*** | **Japan** |
| **DIMETHYL ACETAMIDE*** | **USA** |
| **PIVALOYL CHLORIDE*** | **France** |
| **2 ETHYL HEXANOIC ACID* (OCTOIC ACID)** | **Japan** |
| **PYRIDINE 2°** | **Belgium** |
| **METHYLENE CHLORIDE** | **Holland/<br>ICI make** |
| **ISOPROPYL ALCOHOL (IPA)** | **—** |
| **DIMETHYL FORMAMIDE* (D.M.F.)** | **Japan** |

*** (With MODVAT Benefits)**

Kindly forward trade inquiries

**HASMUKHRAY & CO.**

198, Mangaldas Building No. 3B, Mangaldas Road, Bombay 400 002.
**Tel. Nos.: 31-7815/29-2386/25-1744 Cable: JAYJANAK Telex: 11-82192 JAY IN**
Hyderabad Telephone Nos.: 840408/840356

**MANUFACTURERS OF**

**ACRYLIC MONOMERS**
**BUTYL ACRYLATE**

**WE ARE SHORTLY INTRODUCING**
**FOLLOWING MONOMERS:**

**Ethyl Acrylate**
**2 Ethyl Hexyl Acrylate**
**Methyl Acrylate**

Please Contact Manufacturers:

**Sulaki Chemicals Pvt. Ltd.**

REGD. OFFICE: 0-4, Mahavir Mahal, Plot No. 130, Garodia Nagar,
Ghatkopar (East), Bombay 400 077.
**Phone No.: 5113991, 5113995**

FACTORY: Plot No. C-33, Lote-Parshuram Industrial Area, M.I.D.C. Lote,
Taluka Khed, Dist. Ratnagiri (Maharashtra).
**Phone No. 238**

# Chamber rejects report on natural gas price

The recommendations of the Dr. Vijay Kelkar committee on the pricing of natural gas were rejected at a seminar held at Baroda, on July 20th by the Central Gujarat Chamber of Commerce.

The seminar dealt with the supply of natural gas to industries and the domestic sector. The Kelkar committee recommends that the price of gas be decided on the thermal equivalence of fuel oil. However, the resolution adopted at the seminar demanded that the price should be based on the thermal equivalence of pit head price of coal.

The seminar was addressed by the minister for industries, Mr. Suresh Mehta, the former finance minister, Mr. Sanat Mehta, the chairman of GEB, Mr. Jaswant Mehta, Mr. Prakash Brahmbhatt, Mr. Babubhai Shah (both MPs) and others.

The resolution opposed the move of extending the HBJ pipeline to other parts of South and North India saying that it would not be economically viable. It wanted the government of India to fix the price of gas, according to the D. VKRP Rao award.

The resolution said that for want of a long-term rational utilisation policy, gas worth Rs. 1,600 crores is being flared annually. All these years Gujarat has been paying more than thrice the price of coal paid by those states that are located in the vicinity of coal mines. The resolution demanded that Gujarat should get location benefit of gas similar to the states having coal mines.

The resolution pointed out that in the recent report on new energy policy, the Bureau of Costs and Prices has conclusively suggested that domestic coal is no longer the cheapest energy option in inter-fuel substitution analysis. It will be cheaper to use gas near the landfall point in case of offshore gas and near oil fields in case of onshore fields, it said.

Mr. F.B. Virani, managing director of the Gujarat Gas Company Ltd. (GGCL), pointed out that there are two major impediments to the fullest possible exploitation of the use of natural gas in the state.

The first problem arises out of the Union government's policy to allocate natural gas on the principle of equitable regional distribution rather than deriving the optimum benefit based on techno-economic consideration. Mr. Virani said that heavy capital investments have been made to take gas away to far-off places, where other sources of energy are abundantly available at economic prices.

The second issue is that of the pricing of natural gas. Mr. Virani demanded that the declared price of the Union government at onshore point or at the landfall point calls for rationalisation in order to do away with wastage by flaring

According to him, the uniform price of natural gas levied by the Union government at Hazira and at Jagdishpur in Uttar Pradesh defeated any national thinking. The secondary distribution calls for a safe and intricate network of pipeline that significantly adds to the delivered price of gas. This point is somehow being ignored by the policymakers while pricing the natural gas at landfall point, onshore point or from the HBJ pipeline, Mr. Virani said.

In a recent study, the Union government has accepted distribution of natrual gas to domestic consumers as one of the priority areas. Mr. Virani added that it is established that in the economic ranking of alternative uses of natural gas, city gas distribution ranks the highest. Besides economic factors, t
socio-economic benefits to the midc
and low income group people is t
highest as natural gas replaces polluti
and expensive fuels such as kerosen
firewood, coal, etc. Despite these be
efits, Mr. Virani pointed out, the pri
ing policy of the Union governme
totally ignored the delivered cost of na
ural gas to domestic consumers.

A number of studies prepared
many leading agencies have prove
beyond doubt that a gas price of mo
than Rs. 600 per 1,000 cubic metres w
make it unviable to set up any gas di
tribution facility for domestic consum
ers, he said.

The Union government is prepared
give heavy subsidy on imported petro
eum products such as liquefied petro
eum gas (LPG) and kerosene. M
Virani pointed out that the governme
did not consider it worthwhile to giv
part of that subsidy on natural gas tha
replaces these fuels.

---

## NEW IOC CHIEF LIKELY BY AUGUST-END

The search for a new chairman to th
public sector Indian Oil Corporation ha
begun and the Public Enterprises Selec
tion Board (PESB) has shortlisted ove
15 names, according to industry sour
ces. Of them, 12 have already bee
interviewed and the rest are likely to b
interviewed shortly after which PES
will indicate its choice to the govern
ment, sources said.

Among those interviewed for the to
post are Mr. M.C. Gupta, advisor, Plan
ning Commission, Mr. S.K. Mangli
and Mr. L.L. Bhandari, both director
in ONGC, Mr. N.C. Pai, chairman c
BRPC, Mr. D.K. Chatterjee, an IA
officer from Orissa, Mr. S.K. Shelat an
Mr. E.A. Swaminathan, IAS from Gu
arat. From within the organisation, th
claimants for the post are Dr. Mukho
padhyaya, and Mr. B.K. Bakshi, direc
tor marketing.

# Kathalguri, Amguri power projects: Centre proposes gas linkage

The centre has cleared the project port of the proposed Assam Accord finery at Numaligarh in Golaghat disict of Upper Assam, according to the nion petroleum minister, Mr. M.S. urupadaswamy.

Addressing a press conference at the nd of his two-day visit to Assam, Mr. urupadaswamy said the memorandum f understanding would be finalised oon' by the petroleum minister and ssam government and oil industry fficials at a meeting at Delhi.

"I am personally taking keen interst in the project which was expected o be completed by the end of the Tenth Plan period", he said. The minister said here were environmental problems egarding the project. But the required clearance certificate had been obtained from the ministry of environment.

Mr. Gurupadaswamy said all relevant issues concerning the project would be discussed soon at a meeting between representatives of the petroleum ministry and the Assam government. These two projects, with a total capactiy of 640-mw would boost the economic and industrial development of Assam, he said.

Regarding the proposed power projects at Kathalguri and Amguri, the minister said gas linkage of nearly two million cubic metres for the Amguri project was proposed by the Centre at the inter-ministerial meeting convened by the Planning Commission. The Assam government should take necessary follow up action in this regard, he said.

Referring to the royalty issue, the minister said while the Centre had paid Rs. 60 crores to the state government as royalty for 1989-90, payment for the current year would be made immediately. On the utilisation of crude oil produced in the state, Mr. Gurupadaswamy said production would go up to nine million tonnes during the Eighth Plan period as against the five to six million tonnes figure of the Seventh Plan.

This step has been taken in view of the large investment made by the ONGC and OIL during the Seventh and Eighth Plan period. Mr. Gurupadaswamy said the total expenditure for the proposed gas cracker project and allied downstream industries, would be Rs. 2,300 crores.

The Centre was investing a huge amount during the Eighth Plan despite severe constraint of resources which only demonstrates the sincerity toward the needs of the people of the state, he added. Mr. Gurupadaswamy clarified that construction of loop-lines now in progress, was not for transporting crude oil outside the state. "Looping was not intended to increase supply of crude oil to the Barauni Refinery but to facilitate smooth supply of crude to the refineries in Assam", he said.

The minister appealed to the people to stop agitations aimed at stopping the refineries in Assam he said. The minister appealed to the people to stop agitation aimed to stopping the construction of loop line and ensure that proper atmosphere prevails for the better economic development of the state.

---

## ALFA-LAVAL

The board of Alfa-Laval Ltd., has approved a dividend of 25 per cent on the enhanced equity capital.

Following the bonus issue of 1989, this is equvalent to a dividend of 37.5 per cent on pre-bonus capital, compared to 25 per cent paid last year for 15 months.

AVAILABLE

NAPHTHENIC ACID

ACID VALUE 185

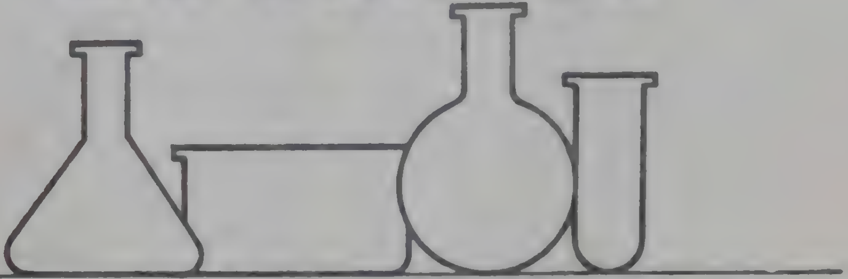
Contact:

CHAWLA WORLD TRADE LINKS

110, Yogeshwar, 135/139, Kazi Sayed Street,
Bombay 400 003.
Phone No.: 325502/329618/330339
Cable: BAKHSHISH

The reliable source of International Quality PIPERAZINES in India

**DIAMINES**



Another First. After Ethyleneamines.

**DIAMINES AND CHEMICALS LIMITED**
**International Quality with Indigenous Ingenuity.**

- PIPERAZINE (PIP)

Intermediate for
Pharmaceuticals
Rubber Accelerators
Corrosion Inhibitors
Surface Active Agents

- AMINO ETHYL PIPERAZINE (AEP)

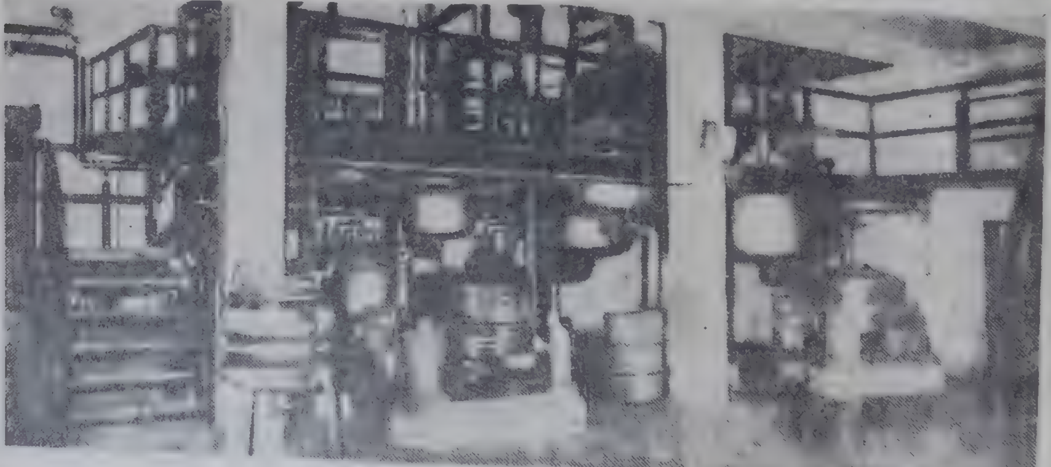
Epoxy Curing Agents
Corrosion Inhibitors
Asphalt Additives
Emulsifiers
Pharmaceuticals
Surfactants

**Ahmedabad (H.O) :**
1. National Chambers, Ashram Road
Ahmedabad - 380 009
Phone 409626 Gram : DIAMINES
**Baroda (Works) :**
Plot No 13, P.O. Petrofils - 391 347,
Dist Baroda
Phone 73305/406 Gram DIAMINES
Telex 0175 352 DACLIN
**Bombay Office :**
85 C Wing Mittal Towers, 8th Floor,
Nariman Point
Bombay 400 021 Phone 2029507
Gram CELAGAR

Novnit/306/

MAG

*Reputed Manufacturers of*
PLANT & MACHINERY for PHARMACEUTICAL CHEMICAL, and OTHER INDUSTRIES.



For further particulars please contact

**MAG ENGINEERING WORKS (INDIA)**
2/A, VAIBHAV INDUSTRIAL ESTATE, NEAR L & T, POWAI,
SAKI VIHAR ROAD, BOMBAY - 400 072. PHONES 6326149, 6328138, 6320674

# Tehri project okayed

The environment ministry has finally ccorded its approval to the controverial 2,400 MW Tehri dam hydel project n Uttar Pradesh.

The ministry cleared the project ecently "after taking into account all he factors" subject to the conditions hat the project authorities get the safety aspects and the design of the dam approved and that comprehensive environmental management plans must be formulated.

In its clearance order, the environment ministry issued certain guidelines, which have to be observed in a time-bound manner.

The Tehri Hydel Development Corporation (THDC) will identify the critically degraded areas conforming to the "very high" and "high" crodability classification and prepare action plans by December 31 this year for the treatment of these areas. This is as per recommendations of the remote sensing applications centre, Uttar Pradesh.

The action plans prepared must ensure that the catchment area treatment is completed before December 31, 1995, on the basis of the detailed annual action plan.

The THDC will put at the disposal of the Government of Uttar Pradesh all the requisite resources annually to implement the action plans.

As part of the obligations of the U.P. Government, the ministry said the state government will cooperate in the preparation of comprehensive action plans for catchment area treatment by December 31, 1990, and to implement these action plans by December 31, 1995, with the resources provided by the THDC.

The ministry made it clear that the completion of the studies, formulation of action plans and their implementation will be simultaneous with the engineering works "failing which the engineering works will be brought to a halt without any extraneous considerations."

The Tehri dam project was initiated in 1972 for an installed capacity of 600 MW, now revised to 2,400 MW to be taken up in three stages. The collection of data and preparation of environmental action plans is yet to be finally completed.

The department of power and the government of Uttar Pradesh have assured to furnish all the detailed action plans according to prescribed time schedule and to implement the action plan, simultaneously with the implementation of the engineering works.

The safety aspects and the design of the dam have to be approved by the high-level expert committee set up for the purpose while the environmental management plans have to be approved from the environment and forests ministry.

On the vital aspects of rehabilitation of the population likely to be affected by the dam, the ministry asked the THDC to undertake a socio-economic study of the measures needed to ensure that the standard of living of the oustees is not affected due to the project.

On the flora and fauna aspect, the ministry said the THDC will commission a study of the vegetation to be submerged by the project so that reclamation plans can be worked out along setting up of botanical gardens.

## GAS & COAL BASED POWER PLANTS: ENVIRONMENT MINISTRY CLEARS MOST PROJECTS

Several gas-based and coal-based power plants with a total capacity of over 4260 mw have received clearance from the environment ministry paving the way for their implementation. Some of these projects have been hanging fire for a long time.

The gas-based projects cleared include the 810 mw Faridabad power project, the 650 mw Gandhar power project, and the 400 mw Dadri stage II project. Clearance of these projects will help the energy ministry, which is relying more on gas-based projects, meet the shortfall in the Eighth Plan power generation target due to delays in clearance of hydel and coal-based plants.

In addition, the ministry has cleared several coal-based power plants. These include the 500 mw Bhandapur thermal power station extension stage IV, 420 mw Korba West Bank thermal power stations units V and VI, 1,000 mw Vindhyachal super thermal power project state II, expansion of unit-I of Neyveli Lignite Corporation, and 420 mw Muzaffarpur thermal power plant state II.

Besides, the 60 mw captive power plant of Madras Refineries and the project for a 400 kv transmission line around Delhi have received clearance.

The Faridabad gas-based power project (stage-I) will have two units of 405 mw each and use 4.50 million cubic metres of lean gas for power generation. High speed diesel (HSD) will be used as a fall-back arrangement.

A recirculating cooling system with natural draft cooling towers is proposed for dissipation of heat in the atmosphere.

The 650 mw gas-based power project at Gandhar in Gujarat will use 2.25 million cubic metres per day of lean gas. It has been stipulated that the waste water will be fully treated by chemical methods before discharge. The major air emissions will be oxides on onitrogen. Due to lack height, the emission reach the ground level within a short distance of one to three kms under different meterological conditions.

# Lower excise duty on aluminium products mooted

The steel and mines ministry has favoured a reduction in excise duty on aluminium products to make them competitive with iron and steel and plastic products.

The ministry has pointed out that while primary aluminium is available indigenously in adequate quantities, there is a declining trend in aluminium downstream products like extrusions, sheets and circles.

Consumers and user industries are preferring products of iron and steel and plastics against similar products of aluminium since they are cheaper due largely to the lower incidence of excise duty of them.

The excise duty on aluminium products is 35 per cent compared with 15 per cent on iron and steel and 10 to 20 per cent on plastic products.

The ministry feels that if the expansion proposals of the primary producers fructify according to expectations, the country shall continue to be surplus in aluminium. It is necessary to consciously promote greater utilisation of aluminium over wood and other materials, both on considerations of ecology and conservation of foreign exchange.

A reduction in customs duty on some vital inputs like coal tar pitch has also been suggested by the ministry to bring down costs in the aluminium industry. Coal tar pitch of requisite quantity and quality is not available from indigenous sources. It was allowed to be imported at a concessional customs duty of 40 per cent till September 1989. The withdrawal of the concession has meant that coal tar pitch attracts a normal duty of 40 per cent basic plus 45 per cer auxiliary plus 45 per cent auxiliary plu Rs. 105 per tonne specific. This has le to a considerable increase in costs fo the aluminium producers.

There is also a need to keep the cos of production of the aluminium industry down since it is power-intensive. I this context, one of the suggestions i the state electricity duty on captiv power generation by aluminium producers like Nalco, Balco and Hindalc be abolished.

The ministry wants a steady suppl of power to be ensured from the Central quota at reasonable rates to smelters of Indal and Malco which do no have their own captive power plants anc their capcity utilisation is quite low.

Production and demand projection for the aluminium industry have show that if there is no addition to the presen capacity of 6.10 lakh tonnes, the country will be surplus in aluminium til 1993-94. The surplus will be 30,000 t 40,000 tonnes in 1990-91, 45,00 tonnes in 1991-92, 9,000 tonnes i 1992-93 and 7,000 tonnes in 1993-94

A deficit will start developing thereafter. The deficit will be 26,000 tonnes in 1994-95 which will increase to 2.7 lakh tonnes in 1999-2000.

But there are expansion plans on the anvil by three of the domestic producers — Balco, Hindalco and Nalco. I gone through, these will together add 2.60 lakhs tonnes of capacity by 1994-95. Balco proposes to expand its capacity by 50,000 tonnes, Hindalco by one lakh tonnes and Nalco by 1.10 lakh tonnes. While the Balco and Nalco expansions are anticipated to be commissioned by 1994-95, the expected year of commissioning of Hindalco expansion is 1993-94. In addition, the Eighth Plan working group has proposed the setting up a greenfield smelter of 3.61 lakh tonnes capacity by 1998-99.

FOR A WINNING DEAL OF
CENTRIFUGES
CALCIUM CHLORIDE
SNOW WHITE POROUS
ANHYDROUS & FUSED
AND
SOLID (70%) & BRINE
ACE INDUSTRIES
Adm. Office:
GALA NO. 14, ALPINE IND. ESTATE
MAROL MILITARY ROAD, ANDHERI (EAST)
BOMBAY - 400 059. PH. OFF.: 6365763
GRAM: MAKCHEMICS-Andheri (West) RESI: 6212378
Factory: J-718/2, G.I.D.C., 40 Shed, VAPI, Dist. Bulsar. Phone: 1494

*Announcing the Publication of*

CHEMICAL WEEKLY

**ANNUAL NUMBER 1990**

**to be released on**

**INDEPENDENCE DAY**

*Highlighting the Achievements of the Chemical Industry over the last few years, the annual will contain*

- * ARTICLES BY EMINENT PERSONS INVOLVED WITH THE INDUSTRY
- * STATISTICS PERTAINING TO THE PERFORMANCE OF THE VARIOUS SECTORS OF THE CHEMICAL INDUSTRY
- * IMPORT AND EXPORT PERFORMANCE, ETC.

**A Unique Opportunity to Reach the Entire Spectrum of the Chemical Industry**

**ADVERTISEMENT TARIFF:**

**Full Page: Rs. 3000** **Half Page: Rs. 1500**

**One-third Page: Rs. 1000**

**Cover Pages on Request**

For more details contact:

**THE ADVERTISEMENT MANAGER**

**SEVAK PUBLICATIONS**

**BOMBAY OFFICE:**
306, Shri Hanuman Industrial Estate,
G.D. Ambekar Road,
Wadala,
Bombay 400 031.
**Phones: 4131198, 4120743**
**Telex: 011-76053**

**MADRAS OFFICE:**
Room No. 9,
3rd Floor,
24, Commander-in-Chief Road,
Madras 600 105.
**Phones: C/o. 471659/419265**
**Telex: 41-6290**

### GOVT. NOT TO SUPPLY POWER

# Pvt. sector mini steel plants allowed

The government announced on July 19, the decision to further liberalise the steel policy by allowing the private sector units to set up steel making facilities up to one million tonnes per annum.

The decision would be applicable both to electric arc furance units and those using small blast furnaces. But they had to be based on energy optimisation technologies.

Announcing the decision at a press conference at N. Delhi, the steel and mines minister, Mr. Dinesh Goswami, said that the proposals from the private sector would be evaluated by a high-level inter-ministerial committee on the basis of a suitable criteria.

The criteria will include the nature of technology to be employed, energy consumption, foreign exchange outgo, usage of indigenous equipment, product-mix and so on. Dispersal of industry will also be an important criteria. In case of areas where there is shortage of power, the steel units will have to set up their own local based captive power plants.

Asked about the debt-equity norms for the private sector steel units, Mr. Goswami said that these will be decided in consultation with the finance ministry. However, the private entrepreneurs will have to bring a substantial part of their own money.

In May the government had announced its new steel policy raising steel production capacity upto 2.5 lakh tonnes in the secondary (private) sector.

The consultative committee of MPs attached to steel ministry unanimously approved this decision during their meeting early recently. Mr. Goswami said the government would ensure no multinationals crept into steel production in the country. Also the dominant position of public sector in steel production would remain, he added.

At present integrated steel plants including private sector Tisco manufacturing 69 per cent of the steel in the country. By the turn of the century the public sector plants would be manufacturing 60 per cent of the projected 31 million tonnes leaving the rest to the secondary sector.

The decision also aims at better dispersal of steel production capacity in the country. As of now most of the steel plants were concentrated in the eastern region, he said. He also said much of the investment had to come from private capital itself for the secondary sector steel plants and the government would not allow them to depend on financial institutions beyond a limit.

He said one of the reasons for this decision was that there was very limited budgetary support available from the government for substantially increasing steel production in the public sector due to paucity of funds. He said very little budgetary support was being given for SAIL's massive modernisation programmes which were funded by generating internal resources. Mr. Goswami categorically said the new guidelines were in no way a deviation from the industrial policy resolution.

He said the purpose of these guidelines was to enable secondary sector to step up its production from the present three million tonnes to six million tonnes by 1994-95 and to 10 million tonnes by the turn of the century to meet the growing and projected demand.

Otherwise the government would have to spend about Rs. 5,000 crores in foreign exchange to import four million tonnes annually by 2000 or live with the "perenial shortage" of this vital commodity, essential for infrastructure development and rapid industrialisation he said.

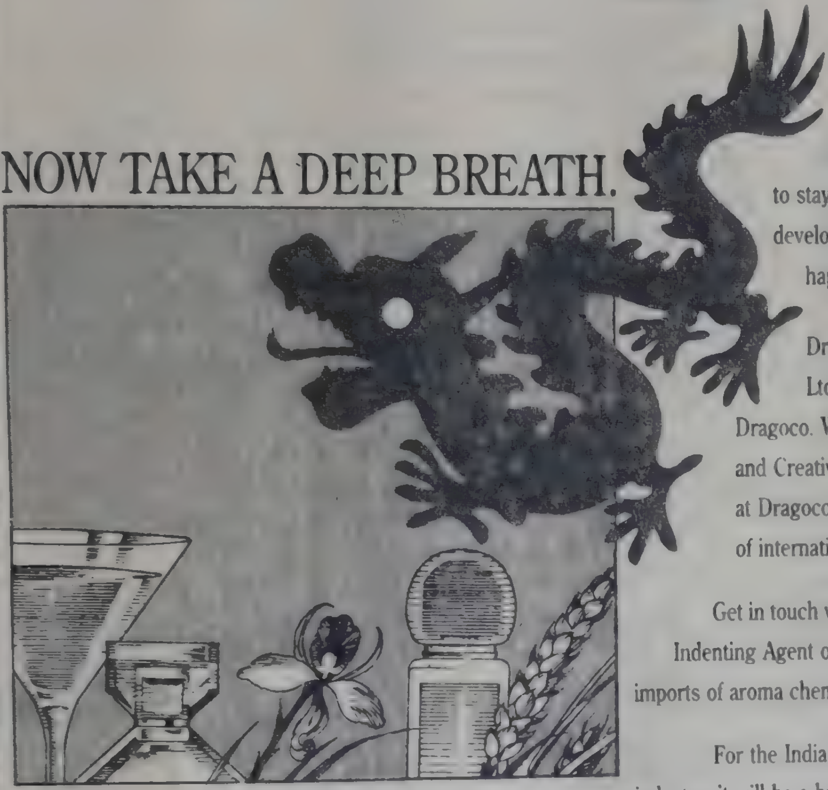
Reeling out statistics, Mr. Goswam said the per capita consumption of stee in the country had gone up from 15 kg in 1974 to a mere 21 kg in 1988 while many other countries had leapfrogged in this sector. In China the per capita steel consumption went up from 36 kg to 65 kg in the same period, in Pakistan from 9 to 70 kg, in South Korea from 93 kg to 369 kg and in developed countries like Japan the consumption was much more.

Mr. Goswami said one of the impending factors for modernisation of the secondary steel sector was the small size of the most of the units. Of the 173 electric arc furnaces in the country today only four have a capacity of more than 1.5 lakh tonnes per annum.

It was necessary that individual units should be of a reasonable size to exploit the advantages of higher productivity and energy conservation in modern technology.

He said the reason for allowing small blast furnaces in the secondary sector was that the availability of electrical power was very important for electric arc furnaces which needed more electrical energy per tonne of steel. He said recent liberalisation has already enabled to increase production of pig iron substantially in the country. This had eased the shortage of the commodity considerably.

He said steel production was likely to go up to 22 million tonnes by the end of Eighth Plan. Of this, SAIL would be producing 13.17 million tonnes, Tisco 3.05 million tonnes, Vishakapatnam 2.70 million tonnes and the rest to be manufactured in the secondary sector. Towards the end of the Ninth Plan SAIL would be producing 17.07 million tonnes and Tisco and Visakhapatnam the same quantity.



NOW TAKE A DEEP BREATH.

The dragon is here. Symbol of the world leader in speciality aroma chemicals.

Dragoco Gerberding & Company GmbH of West Germany is ready to usher in a new era for the Indian flavour and fragrance industry with unique speciality aroma chemicals. Like it already has in five continents through its development centres and technical application laboratories all over the world.

Now it's your turn to take your pick from the Dragoco range of 1000 speciality chemicals. And to stay on top of the latest developments in aromas as they happen across the globe.

Drachem Speciality Chemicals Ltd. is a joint venture with Dragoco. With Technical, Marketing and Creative personnel trained at Dragoco, to bring you products of international quality.

Get in touch with Drachem, the Principal Indenting Agent of Dragoco in India for your imports of aroma chemicals.

For the Indian flavour and fragrance industry, it will be a breath of fresh air.

**Drachem Speciality Chemicals Ltd.**
A 203 Blue Cross Chambers Infantry Road Cross
Bangalore 560 001 Tel: 563083/579228/570526

**C/o Chemicals and Plastics India Ltd.**
Jitendra Industrial Estate Andheri Kurla Road
Andheri East Bombay 400 093
Tel: 6346474/6346475

HTA 9167 A

# India, USSR sign protocol on Bakreshwar project

India and the Soviet Union on July 18, signed a protocol on the Rs. 900-crore Bakreshwar thermal power project in West Bengal, ratifying an agreement reached between the two countries in Moscow recently.

The Soviet Union is to extend financial assistance of Rs. 450 crores besides giving technical know-how and power equipment for the project, which is designed to have about 1,000 mw of installed capacity.

The agreement was signed by the visiting first deputy minister for power, USSR Mr. S.I. Sadovsky and power secretary to the Union government, Mr. S. Rajagopal. The Soviet delegation has visited the site of the plant recently and held discussions with officials of the West Bengal government on the mode of execution of the project which would augment the power supply position in the east. The Soviet Union also agreed to set up a representative office of the USSR ministry of power in India to provide more effective coordination and expeditious solutions to various Soviet-aided power projects in the country.

The agreement to establish such an office is pursuant to a decision taken at the tenth meeting of the Indo-Soviet working group on power held in January 1989. It will be headed by Mr. Sadovsky and include representatives of other concerned Soviet agencies.

The Soviet delegation agreed to expedite the clearance of the proposal to open a similar Indian office in Moscow for the public sector National Thermal Power Corporation. The Soviet delegation, according to an offical release held discussions with Indian officials from July 12 to July 18 in Dell
It also visited the Vindyachal pow
project of the NTPC in Uttar Prades

Both sides reviewed the progre
with regard to the execution of t
Dulhasti-Kishenpur-Srinagar transmi
sion line in Jammu and Kashm
Kahalgaon thermal project in Bihar, a
Kol Dam hydro electric project in Hi
achal Pradesh and decided to ensu
expeditious action on these.

## CABINET APPROVES MINERA POLICY

The new national mineral policy w
approved by the Cabinet recently
official spokesman said. The policy pe
tains to the conservation, utilisation a
development of non-atomic and no
fuel minerals.

The policy which consists of dire
tive principles is to be implemented
the concerned authorities.

FOR READY STOCK

**TITANIUM DIOXIDE RUTILE/ANATASE**
**OPTICAL WHITENING AGENT (POLYESTER)**
**SULPHUR / ACRYLIC AND OTHER DYES**
**TEXTILE AUXILIARIES**

Please Contact:

***CHEMITEX ENTERPRISES***

APEEJAY BUILDING, 4TH FLOOR, B.S. MARG, FORT
BOMBAY 400 001

**Tel. 224084 (3 lines), 242703, 244652** **Telex: 011-4158 KMTX IN**
**Cable: "CHEMTREE" Bombay.**

# Capital goods imports curbed

ajor import policy changes eiled by the government to save 1,000 crores in foreign exchange uld hit import-intensive industries the capital goods sector, consumer ables, electronics and automobiles.

Vhile certain items of capital goods rently importable under OGL were ng shifted to the licensing category, release of free foreign exchange vided for import of raw materials l components required by the auto- biles, consumer durables and elec- nics sector would be slashed by 15 cent.

In a bid to boost exports, it was cided to allow deemed export bene- to the supply of machinery produced ligenously against licences granted to porters under the concessional duty neme. This was with a rider that they cept export obligation of three times volume of machinery supplied. This to be achieved over a period of four ars.

Another fillip for export drive was the tension of benefit of concessional ty of 25 per cent to the import of achinery using Rep licences earned rectly by manufacturer exporters emselves, provided they accept addi- onal export obligation of three times e CIF value of the imported machin- y to be fulfilled over a period of four ars.

The release said that notwithstanding is 15 per cent cut in free foreign change allowed to these industries at e time of issue of supplementary lic- nces, they might use Rep licences addi- onal licences as permissible for the nport of permissible items other than ems on the restricted list (appendix -B) and sensitive canalised list (appen- ix 5-B) of the import-export policy.

This was designed to maintain the esired level of production by these idustrial units the release said. The commerce and tourism minister Mr. Arun Nehru approved the major changes in the import policy with a view to curtailing unnecessary import of capital goods, raw materials and components required by the industry and to promote domestic production, an official release said.

A detailed review to cut unnecessary imports was also undertaken by Mr. Nehru with the commerce secretary, Mr. S.P. Shukla and the chief controller of imports and exports, Mr. Tejendra Khanna. It said consultations were also held with the concerned ministries.

## CAPITAL GOODS IMPORT BILL SPURTS

The Union government's import bill on account of approvals granted to capital goods import during 1989-90 shot up by a record Rs. 595 crores. Last year, the bill rose by only Rs. 237 crores. According to the latest figures, approvals for capital goods imports jumped by over 57 per cent from Rs. 1,037 crores in 1988-89 to Rs. 1,633 crores in 1989-90. These approvals were granted by the capital goods (main) committee of the Union industry ministry.

In 1987-88, approvals granted by the committee were estimated at Rs. 800 crores, which however, represented a drop of 40 per cent over approvals given in 1986-87. Significantly, much of the increase in the approvals took place in the last quarter of 1989-90 i.e. January-March. The increase during the first three quarters of 1989-90 was only by 29 per cent to Rs. 1,154 crores, compared to Rs. 892 crores in the same period of 1988-89. The approvals in the last three months of 1989-90 therefore accounted for as much as Rs. 479 crores. An analysis of the approvals shows that only six sectors accounted for the record increase. These are automobiles, electricals, engineering, iron and steel, metals other than iron and steel, and rubber goods.

Official sources at Delhi explain that the increase could be due to the investment pace which picked up in these areas last year. This also indicates a shift in the investment trends in favour of engineering and related industries. More significant, the sources say, is the marginal increase in capital goods approval for sectors like electronics, chemicals and man-made fibres. Clearly, industry is no longer going in for investments in these areas in a big way, as it was doing a couple of years ago.

The approvals declined in three sectors, namely, cement, ceramics and refractories (by 62 per cent), paper, paper board and pulp (by 28 per cent), and textiles other than cotton (by 76 per cent).

The decline is understandable as industry has been showing little interest in committing fresh investments in these areas.

Electronics, imports for which used to show massive increases in the last few years, indicated an increase of only 52 per cent from imports of Rs. 54 crores in 1988-89 to Rs. 82 crores in 1989-90. Another such item is chemicals, where imports rose marginally be three per cent from Rs. 240 crores to Rs. 248 crores in this period.

Man-made fibres also falls in this category of items, where the investment boom is petering out, say official sources. The increase has been only to the tune of eight per cent from Rs. 160 crores in 1988-89 to Rs. 173 crores in 1989-90.

Other areas showing high imports growth are iron and steel (up by 158 per cent from Rs. 55 crores to Rs. 143 crores), metals other than iron and steel (up by 405 per cent from Rs. 8.34 crores to Rs. 42 crores) and rubber and rubber goods (up by 109 per cent from Rs. 41 crores to Rs. 85 cores).

ONE SOURCE FOR EVERY HIGH QUALITY
ENZYME

★ ENZYMES ★
Amyloglucosidase
Bacterial protease
Chymotrypsin
Fungal Amylase
Fungal Diastase
Lactase ★ Lysozyme
Malt Diastase
Pancreatin ★ Papain
Pectinase ★ Pepsin
Trypsin Chymotrypsin
Mixtures
Serra Peptidase

★ BIOCHEMICALS ★
● Bovine Albumin ● Haemoglobin Powder ● Heparin Sodium ● Lactobacillus Acidophilus

★ SPECIAL ENZYME ★
BLENDS
● Animal and Poultry Feed ● Bakery Application ● Leather Bating ● Protein Hydrolysis ● Textile Processing

Rathi
PAPAINS PVT. LTD

Admn. Office : 105/106, Dhanlaxmi Ind Estate, Opp. Golden Dyes, Old Agra Road, Thane (W)-400 601. Cable : PAPAINS Phones : 504011, 503445, 594705. FAX : (022) 2872811
CITY LIASON : 75-76-A, Mittal Court, Nariman Point. Bombay-400 021. Phone : 244147, 244157, 2049014 Telex : 112844 Cable : Taskforce (Bombay)

WE ALSO STOCK REFERENCE STANDARDS FROM SIGMA & FIP COMMISSION

GRADATION

# Delay in grant of impex code numbers h new exporters

The delay in the grant of impex code numbers to exporters to obtain their import-export authorisation and entitlements is badly hitting the new entrants to export business.

It takes about two months for the joint chief controllers of imports and exports to allot the numbers by which time the letters of credit expire and foreign buyers refuse to take the cargo because the delivery schedules have not been adhered to.

Under the new import-export policy, 1990-93, an inter-departmental screening committee has to clear the credentials of the new exporters before they are given the impex code numbers.

Earlier, exporters were able to get the code numbers within a week or 10 days. Now the delay is at least two months.

Representatives of exporters' organisation told the press that new exporters should be given the code numbers immediately (may be provisional) so that they could execute the export orders.

The screening committee includes joint chief controllers of imports and exports, representatives of concerned export promotional councils and banks as well as officials.

Impex code numbers are to be obtained in addition to the reserve bank number.

The delay in the grant of impex code numbers was also highlighted by exporters in the open-house discussions held in Bombay and Cochin.

They had urged the commerce ministry officials including the chief controller of imports and exports to expedite the disposal of applications for impex code numbers.

The chief controller of imports exports (CCI&E) has said that app tions of new exporters would be cl on a priority basis.

But for imports, scrutiny of the dentials is important as the gover would like to ensure that there leakage of foreign exchange.

The exporters point out that the & E should formulate a time-b programme for clearing the applic for impex code numbers. It shou made public through a notification argue. Some experters even say there is no need for impex code n ers when RBI code numbers are

According to official sources, effort has been made in the new p to assist the bonafide users and ex ers to obtain their import-export au isation and entitlementsw expediti and efficiently.

The government, however, inten exercise the fullet circumspectio vigilance to ensure that various ies and procedures are not misus unscrupulous elements resulting i leakage of foreign exchange and thorised drawal of export incen from the public exchequer.

It is, in this context that scruti the applicants' credentials is carrie before the grant of impex code n ers, and to review the code num already given, wherever necessa see that the particulars supplied b applicants are factually correct sources explain.

In the grant of duty-free lic against export orders to newcomer those who have come under ad notice, the applications would ha be cleared by the inter-departm screening committee, the sources out

# Highlights in Chemical Technology (Part-1)

## EW SOLID CATALYST VELOPED BY RESEARCH OUP (ICI, BP, ROYAL DUTCH ELL AND UNILEVER)

P, ICI, Royal Dutch Shell and Uni- r are all helping found a research n working on new types of solid cat- ts, which could revolutionize chem- s manufacture by avoiding the need se corrosive acids and the like. The rk is in progress at the Davy Fara- Research Laboratories under the ectorship of Prof. John Thomas. Prof. omas is of opinion that the solid cat- sts are a million times more potent. ike liquid acids, the solids can be ed to make the exact molecule uired.

The new solid catalysts have micro- res which offer a large surface area reaction and also have a number of vel properties. For example, they sur- ve down to -200°C and up to very gh temperatures and the pores can be led with selected molecules to tailor e catalytic activity. Only the correctly zed molecules can get through the res for conversion.

Thomas' team have shown that x- ys and neutrons can be used to follow e chemistry inside the micropores. ork is at a relatively early stage but is new approach to catalysis may ove tremendously beneficial in the ng run. (**Mfg. Chemist,** 3/1990, p. 8).

## UROPEAN & US COMPANIES OOST JAPAN'S CHEMICAL NDUSTRY

European and American chemical ompanies have established a strong oothold in Japan and their share of the apanese market is rising. Further, these estern companies are establishing R & centres in Japan with the specific pur- ose of gaining access to Japanese tech- ology and strengthening their market position in Japan and other Pacific countries. These are two of the findings in 'Western Chemical Companies in Japan' a report prepared by the DIA Research Institute, Tokyo, which analyzes the strategies of 19 major American and European Chemical Companies in Japan.

As proof of the growing importance of western chemical companies in Japan, the Report reveals: Sales volume of the 19 companies exceeded US $13 billion or 9% of the value of shipments for the entire Japanese chemical industry, about $144.5 billion in 1988

Sales in Japan represented 6.3%, of total sales for the 19 companies. While total employment in the Japanese chemical industry has only grown marginally, the number of people employed by the western chemical companies has increased by 8% per year and now exceeds 30,000.

Each western company is organized on the basis of a core subsidiary and a series of operating units and joint ventures with Japanese companies. The 19 companies have a total of 139 subsidiaries and joint ventures in Japan. Operating strategies vary with each company, some stress the core subsidiary, while others place emphasis on their joint venture.

MITI of Japan recently comfirmed this study reporting that in total the number of research facilities has grown by 27% since 1984, while the number of research personnel has increased 73%. (**Process Biochem,** Feb. 1990, **Pro Biotech** Feb. 1990, p. 111).

## A KODAK PROCESS TURNS OLD X-RAY FILMS INTO POLYESTER

Eastman Kodak (Rochester, N.Y.) is expanding its process for making polyester from used x-ray films (which has a polyester substrate). Typically recyclers buy used film from hospitals, recover the silver and dispose of the leftover polyester in landfills. At what the firm reports is the world's only methanolysis plant, desilvered x-ray film is combined with scrap from some of Kodak's film packaging and fiber-making facilities. The polyester manufacturing process is then carried out in reverse, explains plant manager. Methanol and a catalyst are added to the waste converting it to dimethyl terephthalate (DMT) and ethylene glycol (EG), which are the raw materials for polyester. DMT and EG are purified via distillation and then reacted.

Currently, about 5% of the 50 million lb of polyester feed for the methanolysis plant is used in x-ray film. Kodak having just completed pilot tests in the technology, is working to increase that proportion and is seeking additional large quantity suppliers. Conservation and more effcient production methods have reduced the amount of scrap available as raw material. (**Chem. Eng.,** 5/1990, p. 23)

## ORGANIC HIGH TEMPERATURE SUPERCONDUCTORS BEGIN TO SHOW PROMISE

Scientists may not after all have to rely only on ceramic oxides for high temperature superconductors in future. Until now researchers believed that these were the only suitable materials, but Japanese chemists at the Univ. of Tokyo have now made a compound that remains superconducting up to a critical temperature (Tc) of 11.4 Kelvin at normal pressures. The compound is organic.

The critical temperature may not seem very impressive when compared to ceramic compounds, but it is the highest yet for an organic superconductor. The critical temperature that researchers had previously obtained were between 2 and 8 K.

The new compound whose chemical formula is represented as — $(BEDTTTF)_2 C_4 (NCS)_2$, belongs to a class of materials known as organic radical-cation salts. The molecules in the compound comprise an organic, positively charged radical-cation. This has an unpassed electron, combined with a negative anion. The cation consists of flat rings of alternating single and double bonds between carbon atoms. These can be interspersed with sulfur, selenium or oxygen atoms.

Many researchers are interested in investigating such compounds because of the way the molecule are arranged. They are stacked up like tiles, which means that electons can move around and interact with each other. Such freedom of movement can give rise to useful properties, such as ferromagnetism or superconductivity.

In 1981 Klaus Bechgaard (of H.C. Oersted Institute, Copenhagen) and Denis Jerome made the first discovery of a superconducting radical cation compound. It was based on tetra methytetraselenafulvalene (BEDT-TTF) and the triodide anion ($I_3^-$).

Since then researchers have been trying to increase the Tc by modifying the cation and varying the anion, in the hope that they might make the magic compound that can superconduct at room temperature. Until recently their success was limited. The highest Tc reached was 8K achieved with an iodine containing compound-(BEDT-TTF) $I_3^-$.

Then a prominent researcher in the field Jack Williams, encouraged members of his own team to investigate compounds containing BEDT-TTF and anions based on metal thiocyanates M(NCS), of the platinum group of metals. These include copper, silver and gold. Williams and his colleagues had already made a superconducting compound containing gold and iodine (BEDT-TTF) Au $I_2$.

The researchers group at North Caroline State University had predicted in Japan in 1986 that these materials had the necessary structural and electronic properties to produce critical temperatures as high as 40K.

Japanese researcher Hatsumi picked up further investigation on the above finding and made a compound containing the copper thiocyanide anion in association with Gunzi salts. They eventually produced a material that had a Tc of 11.4K. Further, research has shown that the new compound has some unusual physical and electrical properties. It appears that the new organic compound, like the superconducting ceramic compound, does not behave like a conventional superconductor. Chemists are now optimistic that they can push the Tc for organic superconductors up a lot further. To this end, researchers all over the world are designing new variations of organic radical cation salts. (New, Sc., 2/10/90, p. 31)

---

## KENAF-A NEW FIBRE FOR PAPER TECHNOLOGY ON THE HORIZON

Part of the world's insatiable demand for wood pulp to make newsprint may soon be filled by a fast growing plant related to cotton and okra. The plant called Kenaf (*Hibiscus cannabinus*) resembles bamboo, though it is not related. It is cultivated in South Texas, USA. The Kenaf Paper Co., formed to produce newsprint from the plant, is investing $40 million to set up a small plant with capacity of 84 tonnes of newsprint per day by 1991.

According to the US Dept. of Agriculture, the paper made from Kenaf is brighter and stronger than conventional newsprint. It also results in less ink rubbing off on readers hands. USA believes that Kenaf could eventually account for 25% of the 12 million tonnes of newsprint consumed in USA every year.

Kenaf plant is a native of Africa and Asia. The USDA had been studyin Kenaf as an alternative fibre to woo pulp for paper making. Kenaf has or outstanding advantage over trees, it a fast growing shrub annually reachin a height of between 5 and 6 metres just 5 months.

Kenaf tolerates salt water and grow well in the humid hot Rio Grade Valle of Texas. Much of the $40 million th the Kenaf Paper Co. is investing will g into dismantling a wood pulp mill i Minnesota, moving the mill to Texa and adapting it to accept Kenaf.

Tropical countries like India shoul look to Kenaf as an alternative chea fibre for newsprint but they will hav to develop the technology based on th fibre. (New Sc., 2/10/90, p. 35).

---

## A WORKSHOP ON MICRO WAVE DRYING TECHNOLOGY IN PHARMACEUTICAL INDUSTRY CONDUCTED BY FDA IN USA

FDA in USA conducted a worksho on Microwave drying technology i 1989. More than 100 FDA staff wer given a presentation by representative from ICI, T.K, Fielder and US pharmaceutical companies demonstratin the emergence of microwave technology in the pharmaceutical industr These companies cited several incentives to convert to microwave dryin from more conventional methods.

1. Lower energy and manufacturin costs
2. Shorter processing timne
3. Increased yield because of reduce product handling
4. elimination of environmental variables from the manufacturing proces
5. Decreased floor space requirement
6. Automation of the granulating an drying process.

FDA is yet to evaluate the effects c microwave heating on product safet (Pharm Technology, 5/1990, p. 38)

## VO-FACED MATERIAL UNDER EVELOPMENT IN JAPAN

A new landmark in material science on the horizon with the Japanese gov- nment's project to study and develop new breed of material for aerospace d other hi-tech industries. The mater- ls change their composition from one le of a sample to the other in a con- uous gradient. They may be metal on ie side, ceramic on the other and a ixture in between.

Japan's Science and Technology gency has been working on these unctionally gradient' materials since 987. It is now planning the second hase of its programme, which aims to rovide practical materials within three ears at a cost of £3.5 million.

One of the project's goal is to develop material which is 100 per cent ceramic n one face and 100 per cent metallic n the other. The ceramic face will cope with very high temperatures, while the metallic face will provide strength. Its purpose is to shield space-craft from the heat of re-entering the Earth's atmosphere, without the need for the cumbersome ceramic tiles that American Space Shuttle depend upon. Unlike these tiles, functionally gradient materials have no joint between components. It is this joint that is likely to break under stress.

Closer to Earth engineers would like to exploit the new materials to build engine parts-for example, combustion chambers and turbine blades. Several groups of Japanese researchers have reported promising results from their work, including materials that can withstand temperatures 1700°C on one side of a thin film with the other side of the film is 1000°C cooler. Researchers at Tohoku University in Sendai have produced a hybrid ceramic carbon material that is up to 2 mm thick. To do so they employed the technique of chemical vapour deposition.

Another group at Sumitomo Electric Industries made a functionally gradient material 3 mm thick by a similar process. The team then bombarded the carbon side with titanium vapour, producing a layer of titanium carbide and finally titanium. They believe that this type of material could provide the key to bonding carbon based materials onto metals.

A group at the Japanese steel maker NKK has also produced functionally gradient films that are 3 mm thick and made of several materials, such as zirconium oxide and nickel. A rival company Nippon Steel (the world's largest steel maker), is working on 4 mm films of titanium copper materials.

Meanwhile, researchers at the Government Industrial Institute, also in Tohoku (Japan), have produced 5 types of functionally gradient materials in four processes. The samples are discs measuring 3 cm across and between 0.1 and 4 mm thick. One method involves igniting powders to create an instantaneous reaction.

One of the results, a unique material of titanium diboride and copper, can withstand a maximum temperature of 1500°C on one side and a temperature difference up to 800°C, between its front and back surfaces. The next stage in the governments research is to produce 30 cms square and up to 10 mm thick. (New Sc., 2/24/90, p. 32).

## A NEW ENVIRONMENTALLY FRIENDLY ELECTRONIC SOLVENT COMMERCIALIZED

James Chemicals (le Roy, NY) has recently commercialized a terpene based solvent for use as an electronic circuit board defluxer. The solvent is designed to be an environmentally acceptable alternative to chlorofluorocarbons (CFCs), 1-1-1 trichloroethane, methylene chloride, acetone and petroleum based solvents.

The company reports that the new solvent is derived from a by-product of the pulp and paper industry. It costs about half as much as competing ones and sells for $14-$21 per gallon. It can be diluted with water by as much as 10:1. It has a relatively high flashpoint of 212°F and is water soluble. (Chem. Wk., 6/13/90, p. 57)

## A NOVEL BIPOLAR MEMBRANE TECHNOLOGY TO RECYCLE SODIUM SULFATE IN PULP & PAPER INDUSTRY

Aquatech Systems (Warren, N.J.), a unit of Allied Signal (USA) and the Ahlstrom Machinery Group (Savonliuna, Finland) have agreed to jointly provide the pulp and paper industry with bipolar membrane technology that recycles sodium sulfate discharges to produce caustic soda and sulfuric acid.

Ahlstrom will have the rights to market and build the Aquatech Systems recovery plants worldwide with exclusive rights in Europe. Since first quarter 1990 Ahlstrom has been operating an industrial scale pilot plant in Finland that reclaims about 130 tonnes/year of sodium sulphate. Commercial units could be available to the US and Canadian pulp and paper industry by the end of 1990.

The chemical recovery technology developed by Aquatech and based on discoveries by Allied Signal in the 1970s, uses bipolar and standard electrodialysis membranes to separate sodium sulfate waste streams into sulfuric acid and caustic soda. In addition to eliminating sodium sulfate discharges, the reverse neutralization represents economically valuable sources of both sulfuric acid, which can be used as a raw material in chlorine dioxide plants and caustic soda. Finland and other Nordic countries have recently mandated that the pulp and paper industry treat or eliminate sodium sulfate waste. (Chem. [illegible]

For your Requirements of:

**ACETATE ▫ CARBONATE**
**CHLORIDE ▫ CHROMATE ▫ DIOXIDE**
**HYDROXIDE ▫ NITRATE ▫ OXIDE ▫ PHOSPHATE**
**SULPHATE Etc.**
**— OF —**
**CADMIUM ▫ COBALT**
**COPPER ▫ LEAD ▫ NICKEL**
**MERCURY ▫ STANNOUS (TIN-II) ▫ ZINC**
**AND OTHER INORGANIC CHEMICALS**

AMMONIUM BI CHROMATE TECH, PURE & EXTRA PURE
POTASSIUM BI CHROMATE A.R. AND
POTASSIUM CHROMATE.

**ACE CHEMICALS**

Bombay Sales Office
A-1, Sahyadri, Pandurang Wadi,
Goregaon (East), Bombay-400 063.
Tel. 6882232 ▫ 6882614

Regd. Office & Factory:
Plot No. N-11, M.I.D.C.
KUPWAD-416 425
Dist Sangli, (Maharashtra).

Print Design

READY STOCK

**AMMONIUM BIFLUORIDE**
**(TECHNICAL & ANODIZED GRADE)**
**SODIUM FLUORIDE - BIFLUORIDE**
**AND**
**ALL OTHER FLUORIDE, BIFLUORIDE,**
**FLUOBORATE AND FLUOSILICATE**
**OF PURE AND TECHNICAL GRADE**

Please Contact Manufacturers:

**GUJARAT FLUORINE CORPORATION**

Correspondence At Residence:
Block No. 4, Bawa P. Bhuvan No. 2, 2, Jalaram Ashish Compound,
Devidayal Road, Mulund (W), Bombay 400 080.
Tel.: 5602538, C/o. 345088.

## A NEW CHALLENGER FOR DIAMOND FILM

It is hardly a year since superha diamond coatings started hitting market in advanced countries Japan a USA, but already there is a competi on the horizon. The new material cubic boron nitride (C-BN) and the fi products based on it for wear and c rosion resistant coatings should be within two years.

Although diamond is harder th C-BN, (C-BN, however ranks a clo second), there are many other are where C-BN shines. Unlike diamon C-BN resists a number of molten meta and it forms a protective oxide layer th — like aluminium's —prevents corr sion. Depending on the temperatu C-BN is immune to acids and alkal

Further C-BN does not react wi ferrous metals as rapidly as diamor does, making C-BN desirable for cu ting tools, reports Walter Larbrough, professor. He with other authorities the field discussed diamond and C-B films at the 17th International confe ence on Metallurgical Coatings held la April.

Interestingly, both diamond and C BN have very similar structures, excep that diamond is all carbon and C-B has boron and nitrogen atoms. La brough says that this may allow or material to be grown on the other without losing crystal orientation, a usef property in electronics.

At present C-BN is made commercially by high pressure techniques an is available only as an expensiv powder. But researchers are producin film versions by physical vapour deposition (PVD) and chemical vapor deposition (CVD), the same methods use for diamond films. Japanese companie are also active on research on thin film of diamond and C-BN advance in thi field. (Chem. Eng. 9/1989, p. 48).

# New Products

## JRCK SPECIAL PURPOSE ROXIMITY SWITCHES

Hans Turck GmbH & Co. KG, West rmany offers special type Proximity itches with extended sensing ranges, alog output, magnet operated and for plications such as explosion-proof, lding proof, pressure proof, high nperatures and non-ferrous metals.

1. Explosion-proof switches are non- ntact, solid state output, reaction free and used for both DC and AC plications. The units are available for -90/80-250 V AC and 10-30 V DC.

2. Pressure-proof switches are oil -pressure resistant upto 500 bar, pres- re compensation principle with glass aled connections, larger switching dis- nce, housing material 1.4104 (high ality stainless steel). The special using construction of pressure-proof vitches facilitates direct mounting of e switch into high-pressure valves or ydraulic cylinder. Main features are the scillator coil surrounded by hydraulic il (pressure compensation principle) nd the pressure-proof glass tube seal- g connection wires between oscillator nd electronic of the switch.

3. Proximity switches with Analog utput give an output signal depending n the distances of an approaching steel rget irrespective of the output func- on. The supply voltage may be any- here in the range of + 15 V DC hrough 30 V DC.

4. Magnet operated switches

*Application:* As proximity sensor for on-contact position detection on neumatic cylinders having pistons itted with magnets.

*Function:* Due to its magnetic field he approaching permanent magnet ixed on the piston saturates the highly permeable and optimized core of the sensor oscillator coil. This results in the change of the sensor oscillator current. The connected amplifier will then evaluate this change in current and convert it into a defined signal.

5. Features of Non-ferrous metals switch:

- Split-body limit switch housing to international standards with plug-in socket.
- One sensing head turns in a different positions.
- Programmable NO or NC PC compatible
- Extended sensing range for non-ferrous metals.
- Adjustment potentiometer located on head.

Ordinary proximity switches have a much lower response to non-ferrous metals than to iron or steel. The selective non-ferrous metal sensor has the unique feature of being able to sense aluminium, brass, copper etc. at much higher sensing distances than the normal "All Metals" inductive sensors. This proximity switch will give non output signal when ferrous metals enter its sensing area. For this very reason, it can be mounted completely flush in steel or in close vicinity of iron structures without the usual precautions you have to take with other unshielded proximity switches.

For further details, contact: Arun Electronics Pvt. Ltd., B/125-126, Ansa Industrial Estate, Saki Vihar Road, Sakinaka, Bombay-400 072.

---

## TEMPERATURE SCANNERS -- COMPATIBLE TO IBM-PC

Arun Electronics Pvt. Ltd. offers Temperature Scanner/monitors Compatible to PC based on powerful Z80A Microprocessor which is built around plug-in cards conforming to EUROSIZE of 100 x 160mm and EUROBUS architecture. The Scanner hardware is based on field proven and extremely reliable Modules. All Modules are configured in a standard 19'' Rack that can withstand harsh environment such as those encountered in process industries, field servicing is easy because the entire hardware is plugged-in functional modules, which can be replaced.

- The company recently developed software to make Scanner compatible to IBM-PC because of which you can store information and get printout when needed.
- The Scanner accepts various standard Thermocouples and RTD Sensor Pt. 100.
- Software Linearisation ensures guaranteed accuracy of 1 C throughout the range for all thermocouples input. O. 1 C accuracy is guaranteed for Pt. 100 input.
- Battery backup provides memory protection during sudden power failures.
- Alarm limits can be set independently for each channel with a provision for relay output option.
- User friendly interface through front panel keyboard and 8 Digits LED display.
- Channel and corresponding data display rate can be programmed as per user convenience. Keyboard lock provides security.
- Skipping of any channel or channels for display is programmable.
- Print output for a hard copy is available as a standard feature.
- Alarm annunciation through front panel LED.
- Built in audio buzzer on alarm and relay output for remote annunciation.

- * Real Time Clock for logging of data and alarm.

For further details, contact: Arun Electronics Pvt. Ltd., at the address given on previous page.

## PORTABLE DIGITAL TEMPERATURE INDICATORS

Arun Electronics Pvt. Ltd., offers hand held portable Digital Temperature Indicators with standard Thermocouples such as Needle type Thermocouples upto 800°C for immersion application, Leaf type Thermocouples upto 1000°C for surface temperature application, Bow type Thermocouple upto 600°C for circular surface temperature measurement.

This Digital Temperature Indicator is available for Iron Constant, Cromel Alumel & Pt. 100 Sensor.

Digital Temperature Indicator has 31/2 digits LCD 0.5'' Ht display, which operates on 9V Battery. Temperature range available is from -5°C to +1200°C with accuracy of 0.5%.

The company also offers all custom built portable thermocouples for various industrial applications.

For further details, contact: Arun Electronics Pvt. at the address given on previous page.

## CARDANOL (CASHEW PHENOL)

A modern plant to produce Cardanol has recently gone on stream in Hyderabad. Set up by Mercury Resins and Polymers Private Limited, this sophisticated automatic plant has a production capacity of 5,000 tonnes a year.

Cardanol replaces phenol upto 25 per cent in the manufacture of phenolic resins for various uses like decorative laminates, industrial laminates, industrial moulding components, water resistant plywood, bakelite moulding powders, sand coating resins for foundry, brake linings and clutch facings and also for marine paints and electrical insulating varnishes.

The new product also upgrades quality, increases flexibility and durability, has better chemical and water resistance, higher electrical resistance and is easy to process.

Further details can be had from Mercury Resins & Polymers Pvt. Ltd., 4-1-885, Tilak Road, Hyderabad - 500 001.

## EMISSION MONITOR

Smoke and dust are by their nature highly visible and are among the most obvious and environmentally sensitive pollutants.

Industry is becoming increasingly conscious of emission of smoke and fine dust to the atmosphere and there is demand across the world for accurate, reliable and continuous monitoring of very low emission levels.

A British system is considered to be the first of its kind to provide industry with simple and reliable equipment for this purpose.

Designed and made by a British company, Combustion Developments, Station Building, Station Road, Bakewell, Derbyshire, DE4, 1GE, England), it can — where particles are small and evenly spread — accurately measure the light transmitted across exhaust ducts.

Robustly-built to be used in the most rugged industrial environments, it utilises a twin transmitter and receiver system and micro-processor technology. The identical "transceivers", which are measured, contain a light source and receiver. Both transmit light alt
tively 32 times every second, and
same time each constantly mor
received light intensity.

Conventional methods currentl
use carry various problems cause
alignment and inaccurate calibra
This new technique engineered b
company recognises any shift in
cal alignment, and the effect of di
any of the optical surfaces is auto
ically compensated for.

The company has designed and m
ufactured a range of high techno
instruments for monitoring combus
processes and atmospheric pollu
emissions. They include one that ch
the build-up of dangerous fumes wi
road tunnels — high concentrations
endanger life and one that can de
fires within pulverised coal mills
very early stage, and continuous,
line non-sampling systems that meas
sulphur dioxide and oxides of nitro
emissions.

## DURMETAL COLD WELDING SYSTEM

Durmetal Cold Welding System i
fast as it is versatile. The System c
sists of a powder and a liquid.
mixing the Base and Activator toget
a molecular reaction starts and the m
ture polymerises. Thus repair is co
pleted within 5 to 15 minu
eliminating maintenance proble
costly repair bills and production do
time.

The rapid setting properties f
application for quick repairs as adhes
bonding compound in continuous p
cess industries, ships, factories, elec
cal installation, laboratories, rep
centres in plants and industries. The v
satile application includes repairs
tanks, pipes, containers, components
machinery items which are under pr
sure without shutting down or emp

he system. With DURMETAL, different materials such as stain- teel, aluminium, cast iron, copper, brass, PVC, etc. can be repaired anently as there is no danger of fire explosion.

ne advantageous features of this setting plastic are many and to sum nay include that cold welding pro- re is simple and is carried out at n temperature. DURMETAL poly- ses completely in 5 to 15 minutes compared to Epoxy compounds ch take many hours. It is harder, e water resistant than Epoxy com- nds and performs better than Epoxy pounds at higher temperatures out much loss of strength and hard- . Moreover, it withstands most cor- ve liquids and has got excellent hining characteristics. It is non-toxic r curing and used where it comes contact with edible products.

he application technique involve ing of Powder and liquid to a flow- paste consistently in small batches ch can be applied on cleaned surface a brush or a suitable tool. The mix- once applied should not be dis- ed. Depending upon the repair irement dry powder can be sprink- which prevents gravitational flow, elerates curing and rectifies the com- ition in case the Liquid is in excess.

he product is available in standard ll and bulk packing of 400gm. der with 400 ml. liquid and 3 Kg. der with 4 litres liquid.

or more information contact: Annie eexpo Marketing Corporation, and Bhavan, 5/5777 Dev Nagar, Post x No. 2556, Karol Bagh, New hi-110 005.

---

## OMBINED FLAME RE- ARDANT, INSECTICIDE ND FUNGICIDE

A chemical which is easy to apply to natural and man-made fabrics and wood to protect against fire, insects (such as woodworm) and fungal attack has been developed by a British company.

'KB 227B', from K B Products, can be applied to seating in aircraft, buses or trains, or to furniture and panelling in homes or public buildings to reduce the risk of fire or insect or fungal infestation. It is also valuable in the preservation of old buildings and antique furniture.

When dried, KB 227B leaves each fibre coated with a clear, flexible film which makes no difference to its feel or appearance, but seals it against ingress of moisture and grime.

The intumescent properties of the coating provide excellent fire protection: tests by the UK's Civil Aviation Authority resulted in a Class 1 certificate — no spread of flame in 90 seconds. The chemical has also been approved by British Rail and is used by some bus operators in the UK.

The coating helps to prevent the fabric fraying when cut or damaged. Its moisture-proof seal stops the absorption of spilled liquids, including oil and ink, making it possible for most spills to be simply wiped off.

The insecticide component protects against the infestation of woodworm, common fleas and head and body lice, while the fungicide prevents various kinds of fungal rot. One spray can withstand more than 12 dry-cleans and may be effective for up to 5 years.

Easily applied by dipping, brushing, spraying or sponging, the storing and handling of KB 227B presents no hazards. It is supplied in 30-litre and 205-litre drums.

For more information contact Dr. D. Kaz, K.B. Products Ltd, Unit 7, Sunnyside Industrial Estate, Hinckley, Leicestershire, England LE10 1PJ.

## NEW CERAMIC CENTER PIPE FOR CEMENT PLANT

Hasle Refractories A/S, Denmark, has developed a special Ceramic Center Pipe or Vortex finder for cyclones in the preheater tower of Cement Rotary Kilns.

In most preheater towers, in the lower stage cyclones, are not usually furnished with Center Pipe, because stainless steel pipe cannot withstand that temperature. Therefore, the efficiency of the lower stage cyclones are not very good and it is only 70-75% when no vortex finder is provided.

Hasle designs vortex finders for every individual cyclone. The vortex finder installation will improve separation, and as a consequence; (i) less material has to be lifted i.e. the load on the main fan is reduced, (ii) the heat exchange is improved because less dust is recirculated.

The efficiency of the cyclone is improved by about 15%, which gives a heat saving and a decrease of gas temperature.

Vortex finder is made of special refractory dense low cement monolith P1700A components, which can be assembled like a jigsaw puzzle.

To erect a vortex finder, it just takes 3 to 4 hours, whereas stainless steel pipe takes many days for replacement; hence downtime can be cut down considerably. In addition, P1700A, Hasle material can withstand, high temperature, thermal shocks, chemical attacks by potassium, sulphur, chlorine, etc. as well as abrasive forces. This leads to longer life, stable and efficient operation of cyclone which is not the case with steel center pipe.

For details write to J.K. Synthetics Limited, Development Department, Kamla Tower, Kanpur 208 001.

## RENDEROC PLUG

Fosroc Chemicals (India) Ltd. now introduces Renderoc Plug, a rapid setting mortar for plugging running leaks.

Renderoc Plug is a ready to use rapid setting mortar supplied in convenient packs. The product is designed for plugging running leaks. The product requires only the addition of water before use. Renderoc Plug conforms to BS-1810-1970, part 4. Where ordinary cement mortar gets washed away by leaking water or where a bonding problem exists for rapid setting mortars, Renderoc Plug comes in handy.

Renderoc Plug instantly bonds to the substrate and gains very high strengths in just a few minutes. Over 50 kg/cm² strength in about 15-20 minutes can be expected, making it the product for plugging live leaks.

Renderoc Plug can be used in basement water proofing to plug major leaks prior to/or after waterproofing renderings. The product can also be used for plugging leaks in water tanks, for quick patching, rapid caulking, joint filling, pointing, water proofing of gaps between precast segments, concrete and brick tunnels, sewage systems, in mines etc. Extremely simple to use -- just add water and apply. Available in handy packs and is very economical to use.

## NITOTILE SP

Fosroc Chemicals (India) Limited now introduces Nitotile SP a high quality Ceramic Tile Adhesive.

Nitotile SP is a cement based powder and is a high quality adhesive for the permanent fixing of ceramic tiles both in damp and totally subermerged conditions, eg. swimming pools. It can also be used for the installation of acoustic boards based on expanded polystyrene, etc. Simple to use; all surfaces must be thoroughly cleaned before application.

All traces of grease or oil must be removed with Fosroc Chemical Degreaser or any suitable degreaser. All loose particles of mortar, old wallpaper, paint etc., must be physically removed.

Nitotile SP is spread on the substrate to a uniform thickness of 2-3 mm. Place tiles firmly into adhesive bed with a twisting motion. Remove excess adhesive with a damp cloth before material has set. Joint grouting may be commenced 24 hours after tiles have been laid. Nitotile SP is available in convenient pack sizes of 15 kgs. and 25 kgs.

---

## NITOCOTE SN 522

Fosroc Chemicals (India) Limited has
also introduced Nitocote SN 522, a h
quality Silicone Water Repellent C
ing. Nitocote SN 522 is a colourless
icone water repellent applied by sp
or brush. The product conforms to B
ish Standard BS: 3826-1969, Class

Nitocote SN 522 on application fo
a colourless water repellent membr
but allows natural breathing of surfa

Nitocote SN 522 can be used o
exposed brick architectured buildin
over porous stone lined surfaces and
cement plasters to prevent water se
age and formation of sludge strea
Also useful in protecting monume

Nitocote SN 522 is easy to use --'j
spray or brush; it is versatile -- suita
for old and new buildings, cement m
tar/brick work/stone surfaces. Allo
surfaces to breathe without allow
external water to permeate.

Protects and retains aesthetic app
of carefully architectured buildings
preventing slime, dust etc., sticking
the surfaces. Further, it can be o
coated with decorative paints if requi
except water based emulsion paints

For more details about these th
products, contact: Fosroc Chemic
(India) Limited IV Floor. Shan
House, 1 & 18, Rajmahal Vilas Ext
sion, Mehkri Circle, Bangalore 560 0

---

# Attention Manufacturers !

We publish regularly "NEW PRODUCTS" columns free of cost. We invite manufacturers/suppliers to send details about the new products invented/marketed by them to be published in these columns.

— *The Editor*

# Indian Standards

**Bureau of Indian Standards has published recently "Handbook 1990" containing list of all Indian standards issued upto 1st April 1990. Starting from this issue, we are going to publish the list of standards relevant to the chemical and allied industry. Readers are requested to contact Bureau of Indian Standards, Manak Bhavan, 9, Bahadur Shah Zafar Marg, New Delhi - 110 002 for further information.**

IS 34:1975 Basic carbonate of lead (white lead) for paints (Amendment No.1, November 1987) (first revision).

IS 35:1975 Zinc oxide for paints (Amendment No.1, October 1987) (first revision).

IS 36:1976 Lithopone (First Revision) (With Amendment No. 1).

IS 38:1976 Antimony oxide for paints (Amendment No. 1, September 1987) (first revision).

IS 40:1971 Carbon black for paints (Amendment No.1, September 1987) (first revision).

IS 44:1969 Iron oxide pigments for paints (Amendment No. 1, July 1989) (first revision).

IS 50:1980 Lead and scarlet chromes (third revision) (Amendment No.2, January 1988).

IS 51:1979 Zinc chrome for paints (Amendment No.1, September 1989) (first revision).

IS 53:1988 Burnswick green for paints (second revision).

IS 54:1988 Green oxide of chromium for paints (second revision).

IS 55:1970 Ultramarine blue for paints (Amendment No.1, November 1987) (first revision).

IS 56:1975 Prussian blue (iron blue) for paints (first revision).

IS 57:1965 Red lead for paints and jointing purposes (Amendment No.1, November 1987) (revised).

IS 58:1976 Litharge (first revision).

IS 64:1972 Barium sulphate pigments for paints (Amendment No.2, November 1987) (first revision).

IS 66:1972 Magnesium silicate pigments for paints (Amendment No. 2, November 1987) (first revision).

IS 67:1979 Silica for paints (Amendment No.2, November 1987) (first revision).

IS 68:1979 China clay (Kaolin) for paints (Amendment No.2) (first revision).

IS 70:1980 Cuprous oxide for paints (Amendment No.1, September 1987) (first revision).

IS 82:1973 Method of sampling and test for thinners and solvent for paints (first revision) (Amendment No.2, April 1977).

IS 101:1964 Methods of test for ready mixed paints and enamels (second revision) (Amendment No. 1).

IS 101(Part 1/Sec 1):1964 Methods of sampling and test for paints, varnishes and related products Part 1 Test on liquid paints (general and physical) Sec. 1 to sec. 7 Sampling (third revision).

IS 101(Part 2/Sec 1):1988 Methods of sampling and test fo paints, varnishes and related products Part 2 Test on liquid paints (chemical examination) Sec 1 to Sec 2 Water content.

IS 101(Part 3/Sec 1):1986 Methods of sampling and test for paints, varnishes and related products Part 3 Tests on paint film formation Sec 1 to Sec 5 Drying time (third revision).

IS 101(Part 4/Sec 1):1988 Methods of sampling and test for paints, varnishes and related products Part 4 Optical tests on paint films Sec 1 to Sec 4 Opacity.

IS 101(Part 5/Sec 1):1988 Methods of sampling and test for paints, varnishes and related products Part 5 Mechanical test on paint films Sec 1 to sec 4 Hardness tests (third revision).

IS 101(Part 6/Sec 1):1988 Methods of sampling and test for paints, varnishes and related products Part 6 Durability tests Sec 1 Resistance to humidity under conditions of condensation.

IS 102:1962 Ready mixed paint, brushing, red lead, nonsetting, priming (revised) (Amendment No. 2, September 1988).

IS 104:1979 Ready mixed paint, brushing, zinc chrome, priming (second revision) (Amendment No. 1, September 1988).

IS 109:1968 Ready mixed paint, brushing, priming, plaster, to Indian Standard Colour No. 361 and 631 white and off white (first revision) (Amendment No. 3, June 1988).

IS 110:1983 Ready mixed paint, brushing, grey filler, for enamels for use over primers (first revision).

IS 111:1950 Ready mixed paint, brushing, undercoating exteior to Indian Standard Colours No. 101, 216, 352, 358, 443 and 632 (Amendment No.4, September 1988).

IS 112:1950 Ready mixed paint, brushing, undercoating interior to Indian Standard Colours No. 101, 216, 352, 358, 443 and 632 (Amendment No.3, September 1989).

IS 113:1950 Ready mixed paint, brushing, undercoating interior to Indian Standard Colours No. 101, 216, 352, 358, 443 and 632 (Amendment No. 4, September 1988).

IS 114:1950 Ready mixed paint, spraying, undercoating interior to Indian Standard Colours No. 101, 216, 352, 358, 443 and 632 (Amendment No. 3, September 1989)

IS 115:1950 Ready mixed paint, brushing, undercoating, exterior, matt finish, to Indian Standard Colours No. 352 and 632 (Amendment No. 3, September 1989)

IS 116:1950 Ready mixed paint, spraying, undercoating, exterior, matt finish, to Indian Standard Colours No. 352 and 632 (Amendment No.3, September 1988).

IS 117:1964 Ready mixed paint, brushing, finishing exterior, semi-gloss for general purposes to Indian Standard Colours No. 101 to 104, 169, 174, 216, 217, 219, 275, 278, 280, 281, 283 352 to 354, 358 to 365, 384 to 388, 397, 410, 442 to 444 (revised) Amendment No.1).

IS 118:1962 Ready mixed paint, brushing, finishing, semi-gloss, for general purposes to Indian Standard colours as required [superseded by IS 124(Part 2)].

IS 119:1962 Ready mixed paint, brushing, finishing, semi-gloss, for general purposes, to Indian Standard colours as required [superseded by IS 124(Part 3)].

IS 120:1962 Ready mixed paint, brushing, finishing semi-gloss, for general purposes, to Indian Standard Colours No. 537, 538, 540, 541, 570 and 574 (revised) (Amendment No. 3, October 1988).

IS 121:1962 Ready mixed paint, brushing, finishing, semi gloss, for general purposes, to Indian Standard Colours No. 414 (revised) (Amendment No. 3, September, 1988).

IS 122:1962 Ready mixed paint, brushing, finishing, semi-gloss, for general purposes, to Indian Standard Colours No.411, 412 and 413 (revised) (Amendment No. 3, August 1988).

IS 123:1962 Ready mixed paint, brushing, finishing, semi-gloss, for general purposes to Indian Standard Colours No. 445, 446, 448, 449, 451, 473 and red oxide (colour unspecified) (revised) (Amendment No. 1).

IS 124(Part 1):1976 Ready mixed paint, brushing, finishing, semi-gloss, for general purposes Part 1 (second revision) (Superseeding IS:125) (Amendment No. 1, September 1988).

IS 124(Part 2):1979 Ready mixed paint, brushing, finishing, semi-glass, for general purposes Part 2 (second revision) (Superseeding IS:118) (Amendment No. 1, September 1989).

IS 124(Part 3):1979 Ready mixed paint, brushing, finishing, semi-gloss, for general purposes Part 3 (Superseeding IS:119).

IS 125:1979 Ready mixed paint, brushing, finishing, semi-glos, for general purposes to Indian Standard Colour No. 106 Navy blue [superseded by IS 124(Part 1)].

IS 126:1962 Ready mixed paint, brushing, finishing, exterior, semi-gloss, for general purpose, to Indian Standard Colour No. 671 (revised) (Amendment No. 3, September 1988).

IS 127:1962 Ready mixed paint, brushing, finishing, exterior, semi-gloss, for general purposes, white (revised) (Amendment No. 3, September 1988).

IS 128:1962 Ready mixed paint, brushing, finishing, exterior, semi-gloss, for general purpose, black (revised) (Amendment No. 4, September 1988).

IS 129:1950 Ready mixed paint, brushing, finishing, interior, oil gloss, for general purposes, to Indian Standard C ours No. 101 to 104, 169, 216, 217, 219, 352, 353, 3 358 to 364, 410, 443, 444 and 628 to 635 (Amendm No.4, October 1988).

IS 130:1964 Ready mixed paint, spraying, finishing for ra way wagon stock. to Indian Standard Colours No. 446 r oxide and red oxide (colour unspecified) (revise (Amendment No. 1).

IS 131:1965 Ready mixed paint, spraying, finishing for ra way under-frames, black (revised) (Amendment No. October 1988).

IS 138:1981 Ready mixed paint, marking for packages a petrol containers (second revision) (Amendment No. September 1988).

IS 139:1981 Ready mixed paint, marking, quick drying, f marking with rubber stamps (second revision).

IS 140:1980 Ready mixed paint, exterior, petrol resisting, a drying (first revision) (Amendment No. 1, September 198 (Superseeding IS:141).

IS 142:1980 Ready mixed paint, exterior, petrol resisting sto ing (first revision) (Superseeding IS:143).

IS 144:1950 Ready mixed paint, brushing, petrol resistin air-drying, for interior painting of tanks and container, r oxide (colour unspecified) (Amendment No. 3, Decemb 1988).

IS 145:1950 Ready mixed paint, slushing, petrol resistin air-drying for interior painting of tanks and containers, r oxide (colour unspecified) (Amendment No. 3, Octob 1988).

IS 146:1950 Ready mixed paint, brushing, petrol resistin stoving, for interior painting of tanks and containers, r oxide (colour unspecified) (Amendment No. 2).

IS 147:1950 Ready mixed paint, slushing, petrol resisti stoving, for interior painting of tanks and containers, r oxide (colour unspecified) (Amendment No. 1, Janua 1962).

IS 148:1980 Ready mixed paint, brushing, undercoating, sto ing, for enamels and general purposes, colour as require (Amendment No. 2).

IS 149:1950 Ready mixed paint, spraying, undercoating, sto ing, for enamels and general purposes colour as require (Amendment No. 2).

IS 150:1950 Ready mixed paint, brushing, finishing, sto ing for enamel colour as required (Amendment No. October 1988).

IS 151:1985 Ready mixed paint, spraying, finishing, sto ing, enamel, for general purposes, colour as required (fi revision) (Amendment No. 1, October 1988).

IS 152:1950 Ready mixed paint, brushing, stoving lead-fre for general purposes, colour as required (Amendment N 3, September 1989).

IS 153:1950 Ready mixed paint, spraying stoving, lead-fre for general purposes, colour as required (Amendme No.2).

154:1950 Ready mixed paint, brushing, dead black for use on metals (Amendment No. 2).

155:1950 Ready mixed paint, brushing, matt-black, for use on wood (Amendment No. 3).

156:1950 Ready mixed paint, brushing, for use on floors, colour as required (Amendment No. 2).

157:1950 Ready mixed paint, brushing, acid and alkali resisting, lead-free, for general purposes to Indian Standards Colours No. 446, 537, 632 and other colours as required (Amendment No. 3, September 1988).

S 158:1981 Ready mixed paint, brushing, bituminous, black lead-free, acid, alkali and heat resisting (third revision) (Amendment No. 1, December 1988).

S 159:1981 Ready mixed paint, brushing, acid resisting (first revision) (Amendment No. 1, August 1988).

S 160:1950 Ready mixed paint, spraying, acid resisting for protection against acid fumes, colour as required (Amendment No. 3, August 1988).

S 161:1950 Ready mixed paint, brushing, matt, heat resisting, colour as required (Amendment No. 3, September 1989).

IS 162:1950 Ready mixed paint, brushing, fire resisting, silicate type for use on wood, colour as required (Amendment No. 3, January 1989).

IS 163:1978 Ready mixed paint, dipping, fire resisting (first revision) (Amendment No. 1, September 1989).

IS 164:1981 Ready mixed paint, for road marking (first revision) (Amendment No. 1, September 1989).

IS 168:1973 Ready mixed paint, air-drying, semi-glossy/matt, for general purposes (second revision) (Amendment No. 2, September 1984).

IS 170:1986 Acetone (third revision) (with Amendment No. 1.).

IS 201:1964 Quality tolerances for water for textile industry (revised) (Amendment No. 1).

IS 212:1983 Specification for crude coal tar for general use (second revision).

IS 213:1968 Coal-based naphtha (first revision) (superseding IS 214:1956 and IS 1272:1958).

IS 215:1961 Specification for road tar (second revision).

IS 216:1961 Specification for coal tar pitch (revised) (under revision).

IS 217:1988 Specification for cutback bitumen (second revision).

IS 218:1983 Specification for creosote and anthracene oil for use as wood preservatives (second revision).

IS 229:1972 Ethyl acetate (second revision).

IS 230:1972 Normal butyl acetate (second revision) (with Amendment No. 1).

IS 231:1957 Amyl acetate (with Amendment No. 1 & 2).

IS 245:1988 Trichloroethylene, technical (third revision).

IS 246::1986 Sodium thiosulphate, crystalline, photographic grade (fourth revision).

IS 247:1987 Sodium sulphite, anhydrous (fourth revision).

IS 248:1987 Sodium bisulphite (sodium metabisulphite) (fourth revision).

IS 249: 1979 Sodium bichromate, technical (third revision).

IS 250: 1964 Potassium bichromate, technical and analytical reagent (revised).

IS 251:1982 Soda ash, technical (third revision) (Amendment No. 1).

IS 252:1973 Caustic soda, pure and technical (Amalgamated revision of IS:252-1962 and IS:1021-1964) (Amendment No. 1).

IS 253:1985 Edible common salt (third revision).

IS 254:1973 Magnesium chloride (second revision).

IS 255:1982 Sodium sulphate, anhydrous (technical grade) (second revision).

IS 256:1972 Glauber salt (sodium sulphate, decahydrate), technical (first revision).

IS 257:1950 Magnesium sulphate (epsom salt), technical (superseded by IS 2730).

IS 258:1967 Potash alum (first revision).

IS 259:1969 Ammonium alum (first revision) (Amendment No. 1).

IS 260:1969 Aluminium sulphate, non-ferric (first revision) (Amendment No. 1).

IS 261:1982 Copper sulphate (second revision) (Amendment No. 1).

IS 262:1982 Ferrous sulphate, heptahydrate (second revision).

IS 263:1983 Boric acid (fourth revision).

IS 264:1976 Nitric acid (second revision) (Amendment No. 1).

IS 265:1987 Hydrochloric acid (third revision).

IS 266:1977 Sulphuric acid (second revision) (Amendment No. 3).

IS 289:1963 Aluminium paste for paints (revised) (Amendment No.2, September 1989).

IS 290:1961 Coal tar black paint (revised).

IS 294:1979 Superphosphate (second revision).

IS 295:1951 Bleaching powder, unstabilized (withdrawn).

IS 296:1986 Sodium carbonate, anhydrous (third revision).

IS 297:1970 Sodium sulphide, technical (first revision).

IS 301:1982 Potassium nitrate for explosive and pyrotechnic compositions (second revision).

IS 307:1966 Carbon dioxide (second revision).

IS 308:1988 Dissolved acetylene (gas) (third revision).

IS 309:1974 Compressed oxygen gas (second revision).

IS 321:1964 Absolute alcohol (revised) (with Amendment No. 1).

IS 323:1959 Rectified Spirit (revised) (with Amendment No. 1 & 2).

IS 324:1959 Ordinary denatured spirit (revised) (with Amendment No. 1).

IS 326:1968 Methods of sampling and test for natural and synthetic perfumery materials (first revision) (superseded by IS 326 Part 1 to Part 18).

IS 326(Part 1):1984 Methods of sampling and test for natural and synthetic perfumery materials (Part 1 to 18) sampling.

S 327:1961 Oil of lemongrass (East India oil of lemongrass (revised ) (with Amendment No. 1).

S 328:1957 Oil of eucalyptus (revised) (with Amendment No. 1).

S 329:1961 Oil of sandalwood (revised).

S 330: 1968 Chromium trioxide (first revision) (Amendment No. 1, April 1982).

IS 333:1980 Potassium permanganate (second revision).

IS 334:1982 Glossary of terms relating to bitumen and tar (second revision).

IS 336:1973 Ether (second revision).

IS 356:1969 Ester gum (first revision).

IS 359:1965 Xylole, industrial solvent grade (revised) (with Amendment No. 1 & 2).

IS 360:1964 Amyl alcohol (revised) (with Amendment No. 1 & 2).

IS 361:1973 Normal butyl alcohol, technical (second revision) (with Amendment No. 1 & 2).

IS 376:1986 Sodium hydroxide, analytical reagent (third revision).

IS 377 O Epsom salt, pharmaceutical (withdrawn).

IS 378:1952 Potash alum, pharmaceutical (withdrawn).

IS 381:1972 Sodium silicate (first revision) (Amendment No. 2).

IS 388.1972 Hydroquinone, photographic grade (second revision) (Amendment No. 1 of 1986).

IS 411:1981 Titanium dioxide, anatase, for paints (Amendment No.1, November 1987) (second revision).

IS 435:1973 Castor oil (second revision) (with amendment No. 1).

IS 439:1976 Industrial coke (second revision) (Superseding IS:4836-1968, IS:5615-1970), IS:6372-1971 and IS:7189-1974).

IS 494:1973 Aluminium stearate for lubricants (first revision) (Amendment No. 1).

IS 500:1980 Potassium metabisulphite, photographic grade (third revision).

IS 501:1976 Oxalic acid, technical and analytical reagent (second revision) (with Amendment No. 1).

IS 505:1978 Light kaolin (second revision).

IS 512:198[illegible] Oil of citronella (second revision).

IS 517:1967 Methanol (methyl alcohol)(second revision).

IS 526:1988 Oil of palmarosa (second revision).

IS 528:1970 Oil of Mentha arvensis (second revision) (Amendment No. 1).

IS 533.1973 Gum spirit of turpentine (oil of turpentine) (first revision).

IS 534:1974 Benzene (second revision) (under revision).

IS 536:1968 Toluole, industrial (first revision).

IS 537:1967 Toluene, pure, nitration grade (first revision) (with Amendment No. 1 & 2).

IS 538:1968 Phenol (carbolic acid) (first revision) (under revision).

IS 539:1974 Naphthalene (second revision) (with Amendment No. 1).

IS 540:1968 Refined cresylic acid (first revision) (under review).

IS 553:1984 Rosin (gum rosin) (second revision).

IS 557:1938 Sodium acetate, photographic grade (third revision).

IS 558:1954 Linseed oil, pharmaceutical (superseded by IS 75).

IS 559:1954 Chromic trioxide (chromic acid) (superseded by IS 330).

IS 560:1980 BHC, Technical and refined (third revision) (with amendment No. 1).

IS 561:1978 BHC, (HCH) Dusting powders (fourth revision) (with amendment No. 1,2 and 3).

IS 562:1978 BHC, (HCH) Water dispersible powder concentrates (fourth revision) (with amendment No.1).

IS 563:1973 DDT Technical (second revision) (with amendment No. 1).

IS 564:1984 DDT Dusting powders (third revision).

IS 565:1984 DDT water dispersible powder concentrates (third revision) (with amendment No. 1).

IS 566:1984 Disodium phosphate, dodecahydrate (second revision).

IS 567:1969 Disodium phosphate, anhydrous (first revision).

IS 571:1969 Monosodium phosphate (first revision) (Amendment No. 1).

IS 573:1985 Trisodium phosphate (third revision).

IS 574:1980 Glassy sodium metaphosphate, technical (third revision).

IS 587:1988 Oil of geranium (second revision).

IS 632:1978 GAMMA - BHC (Lindane) emulsifiable concentrates (fourth revision) (with amendment No. 1).

IS 633:1985 DDT emulsifiable concentrates (second revision) (with amendment No. 1).

IS 634:1965 Ethylene dichloride carbon tetrachloride mixture (3:1 v/v) (revised).

IS 640:1956 Ready mixed red oxide paint for hessian (colour unspecified) (Amendment No. 2, March 1970).

IS 641:1964 Ready mixed paint, brushing, finishing, interior, semi-gloss, for general purposes, white (revised) (Amendment No. 2, October 1988.).

IS 643:1955 Cyclohexane (hexahydrobenzene) for paints.

IS 644:1969 Dipentene for paints (first revision).

IS 645:1955 Decalin (decahydronaphthalene) for paints.

IS 646:1986 Liquid chlorine, technical (second revision).

IS 662:1980 Anhydrous ammonia (first revision).

IS 701:1966 Zinc chloride (revised).

IS 702:1988 Specification for industrial bitumen (second revision).

IS 708:1987 Potassium chlorate for explosive and pyrotechnic industry (second revision).

IS 711:1970 Ferric chloride, technical (first revision).

(To be continued)

# A New Branch of Primary Plasticizer

DAYANAND Y. SUKHTHANKAR
Manager, R & D, Ganesh Benzoplast Limited.

ie emergence of the plastic industry is of particular sig-
ance because of its meaningful contribution in conserv-
scare natural resources and at the same time replacing
nber of traditional material such as metal, wood, leather,
, and textile. The most important advantages of plastics
these materials are (1) ease of mass production, (2)
gy savings and (3) immense possibility of changing the
ical properties of plastics as per requirement. This
ntage can be exploited either by making the required
ge in polymers (say co-polymerising it) or by further
ng other ingredients with the polymers and make the final
ucts suitable for the required purpose. Plasticizers play
important role in building this plastics industry.

a basic formulation for a composition, plasticizer is the
ntial component in addition to the polymer. Apart from
fect on the finished material properties like softness, flex-
ty, extensibility and toughness, it plays an important role
eat processing, combining the functions of processing aids
lubricant action.

olymer industry has made the progress in leaps and
nds, in our country but progress in plasticizer industry
me stagnant. A few numbers of phthalate plasticizer
cially DOP became one and only one representative of
alic plasticizer in this field, especially PVC.

new addition to this plasticizer field is Benzoate Plas-
er — a branch of primary plasticizers. These plasticiz-
re essential ingredients in Adhesive leather cloth, cable,
moulding, hose pipes and packaging industry. M/s.
esh Benzoplast Ltd. are manufacturing a range of Ben-
e Plasticizer, in Tarapore plant in Maharashtra with the
t sophisticated computerised machinery and with strict
ity control.

he usefulness of a plasticizer in a polymeric materials
rimarily dictated by its compatibility with the base pol-
rs. Benzoate plasticizers at a minimum concentration of
with the following polymers are judged by the absence
aze in a dry film. The benzoate plasticizers have excel-
compatibility with the following polymers/rubber.

) Polyvinyl Chloride
) Polyvinyl Chloride/Polyvinyl Acetate
) Polyvinyl Acetate
) Ethyl Cellulose
) Cellulose Acetate Butyrate
6) Nitro Cellulose
7) Nitrile Rubber
8) Styrene Butadiene Rubber
9) Polyacrylates

Now conventional plasticizers are being replaced by Benzoate plasticizer by many processing industries and the proportion of replacement is increasing day by day.

The R & D of M/s. Ganesh Benzoplast Ltd. is equipped with modern facilities and they are adding new plasticizers in the field from time to time. A list of general purpose and special plasticizers are given below:

## General Purpose Plasticizers

### *1) Benzoplast 314*

It is outstanding plasticizer for polyvinyl acetate adhesives, plastisol coating and for leather cloth industry.

It is also used in calendering & extrusion of PVC. It has excellent solvating property and has excellent compatibility with PVC. It has very high tolerance of CPW loading, about two times that of DOP, without any sign of exudation. About 2.5 to 3.5 phr less Benzoplast is required to get same shore hardness than that of DOP. It also enhances mechanical properties. In expanded plastics, the uniform expanded cells are obtained when Benzoate Plasticizers are used. It has excellent petrol extraction resistance and hence used in petrol resistance tubing.

### *2) Benzoplast 342*

It has also above properties and has excellent compatibility with polyurethane, based on both polyester as well as polyether system. It has excellent solvating property.

## Special Plasticizers

### *1) Benzoplast PL 165*

It is a new plasticizer, used for plastisol grade for Leather Cloth Industry. It has all advantages of Benzoate Plasticizer, i.e. excellent solvating power, compatibility, high tolerance for loading of CPW etc.

It has many advantages over BBP like high solvating plasticizer i.e. it does not build up viscosity in a short time. BBP rule at Rs. 50/- Kg, and also has high volatility while this plasticizer is not only cost effective but with additional property of controlling viscosity of plastisol for longer time than that of BBP or DBP. It is very essential Plasticizer which can be used without any other Primary Plasticizer but with any secondary plasticizer or extender in plastisol formulation.

*2) Benzoplast PGDB*

It is an excellent solvator for PVC and it has excellent stain resistance. Vinyl flooring industry use this plasticizer for this important property. It is non-toxic and used in packaging food products. Generally non-toxic plasticizer DOA is being used for packaging food products. This plasticizer has two comings. It has no good compatibility with PVC, so i be mixed with plasticizer which should be non-toxic ar has excellent compatibility and solvation power. Sec large part of DOA is being imported in this country. two shortcomings can be overcome by replacing DOA Benzoplast PGDB. It has the lowest order of toxicity in and subacute studies and is neither persistent nor acc ative in mammels. Its biodegradation to CO and $H_2O$ no problem for disposal and hence strongly recomm in packaging.

FOR YOUR REQUIREMENTS OF QUALITY PRODUCTS
PHENYLBUTAZONE I.P. OXYPHENBUTAZONE I.P
TRIMETHOPRIM I.P.
& Intermediates
HYDRAZOBENZENE
DIETHYL MALONATE
Contact Manufacturers:
**REINE CHEMICALS**
P.O. Box No. 6, GANDEVI - 396 360
Phone: 363/393/563
*For MAHARASHTRA Contact:*
**M/s. KHOKHANI ASSOCIATES,** 3rd Floor, Keshav Baug, 116, Princess Street, Bombay 400 002. Phones: 252244/252688

Attention - Exporters & Local Users
TEREPHTHELALDEHYDE
Please Contact Manufacturers
**Bright-O-Chem**
Plot No. 3917, GIDC, Ankleshwar 393 002.
Phone: 2733

# Promotion of Export Culture in Indian Chemical Industries

**N.S. VENKATARAMAN**
**Nandini Consultancy Centre, Madras 600 090.**

The recent export of a comparatively small quantity of Pol- ster Filament Yarn, in the face of internal glut situation, s hailed as a breakthrough of Indian Chemical Industry's port performance. But, one has to keep in mind that the lian PFY industry has exported the product not as a first oice but only as a last resort, when the product could not sold in India. One can be sure that the export of PFY from dia would stop, the moment that the demand for the pro- ct would pick up in the country in the course of time. We id that the Indian Chemical industry has been remaining a reluctant exporter for the last so many years. One is yet see any definite indication that such an attitude would idergo any positive or dyanamic changes in the near future.

It appears that the Government of India is itself respons- le for this kind of absence of export culture on the part of idian chemical industries, to some extent. The stress laid y the Government on the export potentials of chemical pro- cts, while providing industrial licence, is certainly inade- uate. It's approach to exports, while considering applications or licence by chemical industries, appears to be only a matter f routine and even lip service to exports. The Government wned financing institutions also have failed to use their posi- on and power to insist atleast on part export by the chem- cal projects and ensure that the chemical industries pay dequate attention to the international export opportunities, vhile sanctioning term loan and financial assistance for the rojects. Such stress are not made even in the case of large hemical units, incurring huge outflow of foreign exchange y way of import of capital equipment or technology or pay- nent of dividends and royalty to the foreign collaborators. f the Government has cared to insist on minimum export tleast by all large chemical projects while sanctioning lic- nces and financial assistance, it would have contributed to xport culture creation in chemical industries. Even in the ase of projects that they have accepted export commitment vhile getting industrial licence, there is no way to ensure that uch commitments would be adhered to by the units, There are a number of chemical units, who accept such export commitment for the sake of getting industrial licence, but do not export in practice; and the Government remains as a helpless spectator to such situations.

The Government of India appears to have left the decision on the export of the product to the good sense and profit motive of the Indian chemical industries. And, the Indian chemical industries invariably choose the safe and comfortable path of exclusive Indian market, where they can multiply profits in a protected market with little efforts and initiative. Nothing has done greater damage to the cause and progress of Indian chemical industries than the indulgent attitude of the Government to them, in the name of nursing indigenous technology and industries and avoid competition to them from international market. As a result, after four decades of chemical industrial development, Indian chemical industries largely remain as a weak entity, without strength to stand on it's own feet in the global market. It has become a body, requiring permanent import protection from the Government for survival even in the Indian market. It is not argued that the Government of India's commitments to promote export of chemical products, by way of policy, is inadequate. It has certainly initiated a number of measures and have extended a number of concessions, to enable Indian chemical industries to produce products of international quality standards at competitive cost levels. The scheme for 100% export oriented projects and the advanced licence scheme are certainly laudable moves. But, experience has shown that such schemes by themselves have not been of significant benefit to improve the export performance to the desired levels. New solutions and better methods have to be identified on urgent basis.

There are no dearth of explanations on the part of Indian chemical industries with regard to the causes for inadequate export performance. Uneconomic plant size for export market, high level of interest burden on loans and depreciaion provisions on capital equipment have been cited as some of the reasons for uncompetitive cost of production by Indian units. With regard to the plant size, the Government itself has refused licence to a number of units in the past on the plea that adequate manufacturing capacities have already been created in the country for the products, as if the Indian market is only what matters. The Government owned financing institutions have also rejected a number of applications for financial assistance on the same count. While nothing can be done immediately with regard to the interest and depreciation burdens, global competitiveness can certainly be promoted by putting up large sized plants with adequate and appropriate technology and paying greater attention to the quality standards. One cannot but feel, after viewing the Indian scenario, that efforts initiated in such directions so far have been inadequate.

The export financial incentives offered by Government have not, by themselves, been attractive to chemical industries, in the light of the large profits that are possible to obtain in the quality tolerant, protected and comfortable indigenous market. In today's conditions, a patriotic fervour on the part of the Indian chemical industries is an important input to promote export growth. When such response to the need of exports do not come from the industries, the only alternative open to the Government is to introduce an element of compulsion in the matter. This can be done in a number of subtle and safe ways.

Any new chemical industries, proposed to be put up the small and medium sector, should be sanctioned financial assistance by the Government financing institutions, only if the projects will have economic viability, based on dual pricing system for the products with 75% of the production to be sold on Indian price and 25% of the production to be exported to global market on the prevailing international price. The chemical units, that fail to export any quantity in an year, should not be allowed to declare dividends beyond a minimum stipulated percentage. This would bring pressure on the units to export the products by the share holding community.

In the case of the units that accept export commitments but fail to implement them in practice, the Government should not hesitate to impose punitive tax, until they keep the commitment.

The Indian chemical industries have now reached stage, that they cannot anymore be allowed to funct an agency to fulfill only the domestic demand for th ducts. On the other hand, it should act as a catalyst for g to spur the demand itself. Further growth in Indian che industries can come only by focussing on world market would bring increased real income for the nation and further growth. Focussing on the world market by chemicl industries is not only an urgent requirement nation, but also a pre-condition for the growth of the ical industries themselves.

One would even suspect that Indian chemical indu will lose the relevance to the growth of national eco to the extent that they have hitherto been, if the units, a in the medium and large sector, fail to reorient their ities, outlook and strategies. If such required dynamic tude would not come around in the chemical industri India, the Government cannot remain as an idle spectat such situation.

SKF ADVANTAGE
NO. 1 QUALITY • FULL TECHNICAL ASSISTANCE • WIDEST RANGE • EFFICIENT DELIVER
Genuine Bearings For All chemicals ☐ Fertilizer ☐ Petrochemical & Allied Industries
SKF
SKF Authorised Stockist
Recognised Importer
SIBCO Recognised Stockist
Purushottam Somabhai & Co.
SUPPLIERS OF BALL & ROLLER BEARINGS TO REPUTED INDUSTRIES ALL OVER INDIA

36, sarang street p.o. box no. 3014
bombay: 400 003.

phones: office: 326252 ■ 327701 ■ 323217 ■ 341603
phone Resi: 4122353 ■ 4110288
gram: 'FORESIGHT'
telex: 11-76815 PSCO in

# Speciality Phosphorylated Fatty Derivatives as Prospective Leather Lubricants*

**K. VIJAYALAKSHMI GEETHA BASKAR, V.V.M. RAO & S. RAJADURAI**
**Central Leather Research Institute, Madras.**

## ntroduction

The process of making any type of leather invariably volves the introduction of oil/fat at one stage or the other ough the type of fatty matter or its mode of application may iffer considerably. Thus, oils, fats and their derivatives play significant role in the leather manufacture and their incororation in the leather prevents cohesion of fibres during rying and brings about the lubrication with certain essenal nourished, soft, supple and smooth characteristics. The ils and fats in their natural condition find application in iling, stuffing and tanning and their modified derivatives ind use as soaking, wetting, dye levelling, dispersing, fatquoring and finishing auxiliaries in leather production. Most f the operations involve minor quantities of oils (0.1 to 1%) xcept in fatliquoring where higher amounts (3-25%) are used lepending on the type of leather desired.

The present domestic anionic leather lubricants are the sulphated and sulphited oil fatliquors based on several different ndigenous vegetable, marine, animal and mineral oils either alone or in blends. The drawbacks generally encountered with the leathers processed using the fatliquors based on natural oils are that they are not light fast and prone to develop certain unpleasant rancid/foul odour during ageing. Further, the fatliquors contain very low emulsifier content (30-35% only) capable of getting chemically fixed to the leather. The more neutral fraction which is physically deposited on the leather surface gets depleted off, during repeated washing or dry cleaning operation and the leather loses its softness and becomes hard and rigid.

The modern trend is to produce highly soft, light weight, odour free and tight grained leather for export quality garments, nappas etc. Consequently, the leather industry is looking forward to the development of highly penetrative and substantive type of (low fat extractable) fatliquors capable of rendering more uniform distribution and binding of fat in the leather. In this context, there is good scope for reactive types of fatliquors with the functional groups in the fatty chain with their greater binding affinity for leather. Literature survey reveals many patents on the synthesis and application of phosphorylated fatliquors (1-4). Egg yolk (5) contains 3% phospholipid and is used as an emulsifying agent in the fatliquoring of leathers. Long chain mono and di alkyl phosphates (6) are reported as complex active fatting agents for substantive binding to the leather forming stable metal complex contributing to built-in lubrication. Esterified oils and long chain alcohol esters readily form phosphorylated fatty derivatives (7) with polyphosphoric acid, pyrophosphoric acid, phosphorous trichloride, phosphorous oxychloride, phosphoric anhydride etc. and phosphoric acid group forms stable metal complex with chromium/aluminium sulphate (8, 9, 10).

## Experimental

Recent R & D works at C.L.R.I. were directed to the development of newer phosphorylated fatliquors based on polyethylene glycol inter-esters of oils and polyethylene glycol ethers of long chain alcohols and evaluate their performance on chrome tanned leathers as against commercial sulphated oil and synthetic fatliquors.

### *Preparation of the phosphorylated fatliquors*

The oil-polyethylene glycol 600 inter-esters were prepared by reacting one mole of cotton seed oil/sardine fish oil with 1.5-2 moles of polyethylene glycol at 180-220°C using an acid catalyst for a duration of 3-8 hrs. The alcohol-ether was prepared by reacting one mole of lauryl alcohol with one mole of polyethylene glycol under similar conditions mentioned above. The oils — PEG inter-esters and alcohol-PEG ethers — were reacted with phosphoric acid in unimolar proportions at 150-180°C for a period of 2-3 hrs and the water was collected as a result of esterification.

i) Three types of fatliquors were obtained. The resultant phosphorylated esters and ethers were neutralised to pH 7.0-7.5. ii) The phosphorylated oil-inter-esters were subjected to sulphation using 25% sulphuric acid at 33 + 2°C and neutralised to pH 6.5-7.0 after washing. iii) The phosphorylated oil inter-esters were subjected to oxidative sulphation using 20-25% sodium bisulphite solution at 68 + 5°C for a period of 5-8 hrs.

The intermediate PEG-oil inter-esters and all fatliquors obtained as end products were analysed for the physico-chemical characteristics and reported in Tables 1, 2, 3 and 4. The stability of 10% water emulsion of the experimental fatliquors was tested with 5% solution of sodium chloride, calcium chloride, magnesium sulphate, chrome liquor and pickle liquor and the findings are reported in Table 5.

Phosphorylated alcohol-ether and sulphited phosphorylated fatliquors were chosen for application on leathers owing to the remarkable stability of their water emulsions over the neutralised and sulphated products. The fatliquors were tested on chrome tanned cow hides in the processing of softie uppers following the conventional application procedures against the control viz. the leathers treated with synthetic fatliquor and the respective straight sulphited fatliquor. The leathers were evaluated for their feel and strength properties.

---

* Presented in the 45th Annual Convention of Oil Technologists' Association (India) held during Feb. 10-11, 1990 at New Delhi.

**Table 1**

| Characteristics | Cotton seed oil | PEG inter-ester | Sardine fish oil | PEG inter-ester |
|---|---|---|---|---|
| Acid value (mgms KOH/gm) | 2.5 | 0.5 | 24.0 | 2.5 |
| Saponification value (mgms KOH/gm) | 191 | 88.4 | 193 | 101.9 |
| Iodine value gms $I_2$/100 gms | 103.5 | 39.9 | 147.7 | 92.1 |
| Unsaponifiables (%) | 0.8 | 0.5 | 0.75 | 0.5 |

## Results and discussion

### *Analysis of raw oils and their respective esters*

Cotton seed oil contains 25% oleic, 50% linoleic and 25% palmitic acid. Sardine fish oil contains 76% unsaturated acid $C_{16}$-$C_{22}$ and 24% saturated acid. The absence or negligible acid value in Table 1 indicates almost complete esterification of the fatty acid. The reduced saponification and iodine values of the inter-esters show the formation of straight chain polyethylene glycol ester, monoglyceride and diglyceride. The analysis of phosphorylated fatliquors in the neutralised, sulphated and sulphited cotton seed and fish oil based fatliquors are given in Tables 2 and 3 and that of phosphorylated alcohol ether in Table 4.

**Table 2**
**Analysis of phosphorylated fatliquors**
**(cotton seed oil based)**

| Characteristics | Neutralised | Sulphated | Sulphited |
|---|---|---|---|
| Water content (%) | 11.8 | 12.5 | 6.7 |
| Total fatty matter (%) | 85.2 | 84.1 | 90.3 |
| Emulsifier % (alcoholic solubles) | 31.3 | 39.8 | 55.2 |
| Neutral oil % (petroleum ether solubles) | 53.9 | 44.3 | 35.1 |
| Ash content % | 2.2 | 3.5 | 3.2 |
| Phosphorous % | 1.45 | 0.41 | 0.47 |
| Sulphur % | | 2.5 | 2.8 |
| pH of 10% water emulsion | 7.2 | 6.8 | 6.9 |

**Table 3**
**Analysis of phosphorylated fatliquors**
**(Fish oil based)**

| Characteristics | Neutralised | Sulphated | Sulphit |
|---|---|---|---|
| Water content (%) | 5.1 | 9.8 | 7.8 |
| Total fatty matter (%) | 91.2 | 86.3 | 89.1 |
| Emulsifiers (%) (alcoholic solubles) | 40.7 | 45.5 | 51.7 |
| Neutral oil % (Pet. ether solubles) | 50.5 | 40.8 | 37.4 |
| Ash content (%) | 2.5 | 3.8 | 3.5 |
| Phosphorous (%) | 1.7 | 0.65 | 0.65 |
| Sulphur (%) | - | 2.8 | 2.95 |
| pH of 10% emulsion | 7.5 | 6.9 | 6.8 |

**Table 4**
**Analysis of phosphorylated alcohol-PEG ether**

| Characteristics | |
|---|---|
| Water content (%) | 14.5 |
| Total fatty matter (%) | 81.5 |
| Emulsifier (%) (alcoholic solubles) | 45.3 |
| Neutral oil (%) (Pet. ether solubles) | 36.2 |
| Ash content (%) | 3.8 |
| Phosphorous (%) | 1.35 |
| pH of 10% water emulsion | 7.6 |

The total fatty matter in all the sets of fatliquors rang
from 81-91%. The emulsifier fraction in ether phosphates
well as sulphated and sulphited ester phosphates is more th
the straight neutralised fatliquors. This can be understo
from the fact that the oils have undergone sulphation and s
phitation at the reactive sites such as the hydroxyl, act
methylene group and double bond in addition to their re
tion with phosphoric acid. The higher emulsifier contents
these products contribute to the improved stability of the wa
emulsions as depicted in Table 5.

The visual assessment of leathers as seen in Table 6 sho
that the leathers processed with phosphorylated fatliqu
were more soft and full than those processed with strai
sulphited or synthetic fatliquors. Leathers fatliquored w
fish oil based products showed better softness and fulln
as compared to the leathers treated with all the other fa
quors. With regard to strength properties of leathers, tens
stitch tear and tongue tear of the experimental leathers w
quite comparable with those processed with the sulphited
synthetic fatliquor, the variation being very marginal.

## Conclusion

Phosphorylated fatliquors have been developed for the f

Table 5

Stability of the water emulsions of various fatliquors

| tliquor | Sodium chloride (5% solution) | Magnesium sulphate (5% solution) | Calcium chloride (5% solution) | Chromium sulphate (5% solution) | Pickle liquor 10% NaCl + 1.5% sulphuric acid |
|---|---|---|---|---|---|
| tton seed oil:<br>hosphorylated) | | | | | |
| Neutralised | Stable | Unstable | Unstable | Unstable | Unstable |
| Sulphated | Stable | Stable for 5 mts | Stable for 5 mts | Unstable | Unstable |
| Sulphited | Stable | Stable for 20 mts | Stable for 20 20 mts | Stable | Stable for 5 mts |
| sh oil<br>hosphorylated) | | | | | |
| Neutralised | Stable for 15 mts | Stable for 5 mts | Stable for 5 mts | Unstable | Unstable |
| Sulphated | " | " | " | " | " |
| Sulphited | Stable | Stable for 20 mts | Stable for 20 mts | Stable for 40 mts | Stable for 15 mts |
| EG Alcohol<br>her phosphate | Stable | Stable for 15 mts | Stable for 15 mts | Stable for 20 mts | Stable for 15 mts |

Table 6

Visual assessment of leathers

| eathers | Softness | Grain tightness | Fullness | Overall properties |
|---|---|---|---|---|
| Cotton seed oil phopshorylated sulphited | ++ | ++ | ++ | ++ |
| Cotton seed oil sulphited | ++ | + | + | + |
| . | | | | |
| Fish oil phosphorylated sulphited | ++++ | ++ | +++ | +++ |
| Fish oil sulphited | ++ | + | ++ | ++ |
| I. | | | | |
| Phosphorylated alcohol ether | +++ | ++ | +++ | +++ |
| Synthetic fatliquor | ++ | ++ | ++ | ++ |

Table 7

Strength properties of leather

| eathers | Tensile strength (kg/cm²) | Elongation at break (%) | Tongue tear strength | Stitch tear strength |
|---|---|---|---|---|
| a Cotton seed oil phosphorylated sulphited | 240 | 60 | 38.0 | 158 |
| b. Cotton seed oil sulphited | 228 | 58 | 32.0 | 155 |
| I. a. Fish oil phosphorylated sulphited | 248 | 60.2 | 42.5 | 167 |
| b. Fish oil sulphited | 235 | 65.3 | 33.5 | 160 |
| II. a. Phosphorylated alcohol - ether | 245 | 55 | 35 | 165 |
| b. Synthetic fatliquor | 230 | 62 | 28 | 145 |

time at CLRI. Fatliquoring trials have clearly revealed that they are far superior over the other marketed commercial fatliquors in view of their possessing higher emulsifier content with the functional reactive groups capable of binding to the leather. The remarkable stability of the aqueous emulsion towards pickle and tan liquor enables its use even during pretanning and tanning stages aiding in even and uniform distribution of fat and chrome thereby producing leathers with superior feel and strength properties. The processed leathers are light fast and free from rancid odour proving thereby their suitability as alternates to sperm oil based fatliquors.

**References**

1. R. Heyden, Das Leder, **20**, 2, 8 (1969).
2. Alan Gill, J. Soc. Leath. Trades. Chem., **56**, 25 (1972).
3. Clinton E. Retzch J. Am. Leath. Chem. Assoc., **71**, 102 (1976).
4. Patent No. DE 1,548,947.
5. G.D. Maclaughlein and E.R. Theis, The Chemistry of Leather Ma facture 733, (1945).
6. K.J. Kedlaya, P.S. Venkatachalam and D. Ramaswamy, Leather Scien 21, 6 (1974).
7. Patent No. DE 2,207,562.
8. Patent No. DE 2,512,964.
9. Jameison and Solomon, J. Chem. Soc., 4013 (1954).
10. Jameison and Solomon, J. Chem. Soc. 3655 (1955).

LOOKING FOR MERCURY SALTS?

Contact us immediately for super quality, competitive price.

Manufacturers of:

MERCURIC CHLORIDE
MERCURIC ACETATE
MERCURIC IODIDE
MERCURIC NITRATE
MERCURIC SULPHATE
MERCURIC OXIDE
MERCURIC THIOCYANATE
OTHER METALLIC SALTS

M/s. L.S. CHEMICALS & PHARMACEUTICALS

10, Kotkar Industrial Estate, Off Aarey Road, Goregaon (East), Bombay 400 063.
Phone: Factory: 692391 Office: 696963 Resi.: 6285735.

EXPORT ENQUIRIES ARE WELCOMED

WE BUY REGULARLY
a. Propylene Glycol/D.P.G.
b. Mono-Ethylene Glycol/D.E.G.
c. Phthalic Anhydride/Iso-phthalic Acid
d. Maleic Anhydride/Fumaric Acid
e. Styrene Monomer
f. Epikote 828 or equivalent
g. Phenol, Bisphenol-A, Acetone
h. Epichlorohydrine
i. M.E.G. wastes for distillation
j. Di-chloroethene/Ethylene Dichloride

WE SELL/MARKET
Unsaturated Polyester Resin
a. G.P. Choke, Electrical, Sheet, Molding Button, Boat, Auto grades.
b. Iso phthalic-Corrosion Resistant Laminating, Auto (high impact) D.M.C./S.M.C. Grades etc.
c. Bisphenol-A grade Polyester Resin.
d. Gelcoats/Vinyl Esters
Epoxy Resin-Liquid & Solid, Virgin and formulations
Bisphenol-A for Epoxy etc. M.E.G./D.E.G.

SINGH PLASTICISERS & RESINS (I) PVT. LTD.
117-B, Arjun Nagar, Saidarjung Enclave, New Delhi 110 029. Phone: 606841, 608260.
*We regularly buy industrial solvent wastes and distill them.*

# INTERNATIONAL LEATHER SCENARIO

## KISTAN

The leather and leather products lustry plays a significant role in the onomy of Pakistan. Six years ago it is the fifth most important export lustry and today it is the second. The ce of export earnings accelerated pidly, being worth 1000 million pees in 1979 and 8375 million in 1989 S $400 million).

## DOCHINA

The recent changes in Eastern Europe e going to produce new trading patrns and business opportunities. At the ime time the centrally planned economies of South East Asia have also been hanging. New economic policies in aos and Vietnam are aimed at the open market and an increase in private business and these are having an effect on e developments in the local industry.

## AIWAN

During the 60s and 70s Taiwan's hoe exports grew rapidly. Faced with mounting overheads, rising competition nd the appreciation of the NT dollar aiwanese shoemakers saw a turning oint. The exports started to take off and hen to fall. In the first eight months of 89 this trend became more pronounced. The overseas sales dropped by nearly 0% in volume and 12% value to US $2.1 billion. The biggest fall came in exports to the US which were down over a fifth to around 185 million pairs. Exports to Europe in the same period were down to US $426 million.

## THAILAND

With an intended production of 5000 skins per day, the first sheep skin tannery to be built in Thailand opened in mid April. The project has an investment of US $10 million and the funding has come from New Zealand, Australia and Malaysia and also from the Bank of Bangkok. *Leather in Asia (April/June 1990).*

## COLOMER TACKLES STAIN

Grain stain in sheep skins resulting from poor flaying technique affects tanners around the world. And all too often because the damage is concealed beneath the wool, it is only discovered after processing. In an effort to help remedy it, Colomer tanning group of Spain, undertook an exhaustive study of all types and causes of grain stain and the following are the recommendations:

— in no way pull the wool especially on the flank

— prepare the skin for pull off by detaching from all four legs using fist and forearm without exerting traction

— one final pull off ensures that parallel lines of tension do not pass through flanks

— where pull off is by machine ensure the skin is clamped doubled with the wool folded inside or use a clamp that does not exert strain on the wool, with the direction of traction centralised along the backbone line of the carcass. *Leather*, **192,** (4580), 1990.

## BRAZILIAN TANNING INDUSTRY

The Brazilian tanning industry is working at less than 60% of capacity due to economic difficulties caused by phenomenal inflation. But despite insecurity about the future, tanners continue to do business in the hope that the new government's anti-inflation policies will reverse the country's economic decline. *Leather*, **192,** (4580) 1990.

## HIDE SHORTAGE IN ARGENTINA

The decline of Argentina's beef industry has hit tanners hard. The country's herd has dropped by more than 10 million head in just over a decade and although tanners say they can exist with the lower kill and soaking less, the reality is that many are turning to value added processing. *Leather*, **192,** (4580), 1990.

## NEW SPRAY FINISHING SYSTEM

Duo Tech, the new spray finishing system from DeVilliss, is said to revolutionise the process of industrial spray finishing and set new standards of paint saving, efficiency and compliance with impending legislation. Duo Tech is an air atomising system using high volumes of air at low pressures. *Leather*, **192,** (4580) 1990.

# LEATHER ABSTRACTS

The use of electrolytically stable fatliquors in the pickle to improve leather quality, T.H. Weslager, *J. Am. Leath. Chem. Assoc.*, **85**, 72, 1990.

The concept of fatliquoring in the pickle is certainly not a new one, but advances in emulsifiers and in fatliquoring systems have made this application less difficult and yield results which are both advantageous and cost effective to the tanner. This paper presents developments in emulsion and fatliquor systems which make the use of fatliquor in the pickle a reality and explains the advantages and practical benefits to the tanner. The advantages of fatliquors based on aniline allyl polyglycol ether derivatives in the pickle and tannage over anionic, nonionic and cationic products used in this application.

Crosslinking of collagen with acrylic derivatives, I, Li Yuig, F. Scholnick and S.H. Feairheller, *J. Am. Leath. Chem. Assoc.*, **85**, 78, 1990.

Two derivatives of acrylamide, namely: N-hydroxy methylacrylamide and N,N'-(1,2-dihydroxy ethylene)-bisacrylamide, were found to react rapidly and at least in part, irreversibly with hide and skin collagen. As measured by shrinkage temperature, the two compounds effectively crosslinked this collagen and with proper control, could serve as tanning agents. Shrinkage temperature of 85°C and higher were obtained. The products exhibited required resistance to chemical and enzyme attack and, in a small scale, were made into white or pale yellow leather, respectively. The results were compared to those obtained with formaldehyde and glyoxal.

The influence of additives on hot pressed leather — Pleather, R.T. Markus, A. Duman and A. Wyler, *J. Soc. Leth. Tech. Chem.*, **74**, 74, 1990.

A novel process has been developed to produce 'hot pressed leather fibre composite', a new material from leather scrap. Characteristic of the process are the raw material, scrap of mixed tannages skin or hide reduced to fibres and the process parameters, namely temperature and high pressure. By use of additives and by changing the process parameters the internal structure and mechanical properties of this new material may be changed. Ageing of the material, apparent in the change of its mechanical properties and its structural background has been investigated. Ageing studies revealed the compatibility of additives with the raw material. Because of the relationship of the m
ial to both plastic and leather, the
'Pleather' was coined to designat
material.

The impact of hide defects on to
leathers, Robert Koeppen, *The Le
Manufacturer*, **108,** (3) 19, 1990.

The production of aniline lea
requires a very pure blue stock.
ALCA Raw Stock Committee ha
dertaken a study of hide defects w
could cause problems. Some of
commonly observed defects are: G
warts, ringwork, ditting, manji and
(urine and manure damage). Som
the findings are outlined in this pa

Radiation curing of leather finis
*J. Am. Leath. Chem. Assoc.*, **85,**
1990.

Reduction of air pollution, lo
energy costs and good physical p
erties are the major advantages of
use of solvent-free finishes cured
ultraviolet or electron beam radia
This is offset by disadvantages suc
increased chemical and equipment c
of rigorous safety precautions. T
and other factors must be consid
before adoption of the process by
leather industry.

For Your Requirements of

4 NAP * NASDA * OWA * OCT 99%
6 NADSA * OAPSA * 1-3-5 PYRAZOLON
SULPHOPHENYL 1-3-5 PYRAZOLONE
META AMINO ACETANILIDE
1-(4-SULPHOPHENYL)-3-CARBOXY-5-PYRAZOLON

Contact Manufacturer

**MAHENDRA INTERCHEM P. LTD.**
136/15-16, GIDC INDUSTRIAL ESTATE, VAPI, GUJARAT - 396 195
*Office:* Hari Building, 2nd Floor, 58/64, Shaheed Bhagat Singh Road, Bombay 400 023.
**Phone: 2864510; Cable: PEEGABO, Bombay; Telex: 011-6338 MBPG IN**

# INDIAN LEATHER SCENE

## EATHER GARMENT EXPORTS ICREASE BY OVER 100 pc

The export of leather garments creased by over 100 per cent in 989-90 to Rs. 332.88 crores, as against s. 166.15 crores in the previous year. ccording to Mr. M. Mohammed ashim, chairman of the Council for eather Exports (CLE), this trend will ontinue in the future and the export of eather garments could touch Rs. 500 rores, if not more.

Mr. Hashim, who was announcing rovisional figures for the financial year ust ended, said that the first three nonths of the current yuear too have hown a growth of 36 per cent over the corresponding period of the previous year and that the overall forecast for the year is positive.

The total export figure of leather goods for the year 1989-90 is Rs. 2030.04 crores, against a target of Rs. 2000 crores and the previous year's figure of Rs. 1608.39 crores. Of this, semi-finished and finished leather goods accounted for Rs. 714.59 crores, leather footwear Rs. 171.43 crores, footwear components Rs. 518.25 crores, leather garments Rs. 332.88 crores and industrial leather manufactures, saddles and harnesses Rs. 292.88 crores.

There was a 46 per cent decline in the export of semi-finished leather, following the phasing out of the export of the product. Apart from the growth in leather garment exports, leather goods and industrial manufactures showed a growth of 54 per cent, saddles and harnesses 40 per cent, leather footwear 32 per cent, footwear components 22 per cent and finished leather 7 per cent. The Federal Republic of Germany (FRG) was on top of the importers' list at Rs. 370.78 crores. It imported about Rs. 350 crores of garments and shoes. The USSR came next at Rs. 310.11 crores.

The last year's figures for the FRG and the USSR were Rs. 253.53 crores and Rs. 340.24 crores respectively.

The USSR was the leading importer of Indian leather goods in 1988-89 but had fallen to the second place due to its foreign currency problem, Mr. Hashim said.

The US came third, importing Rs. 270.61 crores worth of goods. Mr. Hashim stressed that the industry hopes to double this figure in the current year.

The share of value-added products increased to 65 per cent in 1989-90 as against 57 per cent the previous year. This is because of the increase in exports of leather garments and footwear and also because the export of semi-finished leather has been phased out.

The increase of leather garment export is also because of the increasing cost of manufacture in other South East Asian countries, such as South Korea and Hong Kong, due to high wage levels and other problems.

India's share of the world leather market is 2 per cent now, and because of the potential the country has in this area this could be increased to 5 per cent by the turn of the century, said Mr. Hashim. This long growth span, in spite of the country's advantages, is because of the lack of machinery and low level of modernisation in the industry.

The CLE organised a display of Indian leather products in Sydney and Melbourne, he said, and this was done with the assistance of the International Trade Development Centre of Sydney and the Indian consulate there. A buyer-seller meet in Tokyo and Seoul in February-March this year was received very well, he said. There have been several business queries, as well as interest in collaborations.

Four collaboration projects in Russia have been approved, one for footwear and the rest for finished leather. These will help to increase growth in Indo-USSR leather trade.

The council may organise a programme for familiarisation of Indian products in the U.S.A. to enable independent marketing of Indian leather goods in that country. Other programmes proposed for this year are buyer-seller meets in the Middle East countries. A 5-member sales-cum-study team will be sent to France, FRG and Spain, and another to Denmark, Norway, Sweden and Switzerland..

The council plans to participate in a number of international fairs to help increase trade in and awareness of Indian leather products. Among these are the International Men's Fashion Week at Dusseldorf in August, the **Semaine Du Cuir** in Paris in September, the GDS International Footwear Fair in Dusseldorf in September, the International Leather Goods Fair at Hong Kong in November, the NAMSB Show in New York in March 1991 and the MAGIC Show at Las Vegas in March 1991.

The annual International Leather Fair in Madras is expected to have increased foreign participation this year. It will be held in January-February 1991 and will have an increased exhibition space too. The Council, Mr. Hashim said, will put up a separate training institute in Madras with the help of financial institutions and this will be developed into a full-fledged training institute in the next year.

Seminars on export documentation, finance for the leather industry and marketing are planned in various parts of the country.

The leather industry is set for a big forward leap with the country's first common effluent treatment plant, serving a cluster of tanneries at Vaniyambadi in Tamil Nadu's north Arcot-Ambedkar district, ready to go on stream in August.

The project taken up under the umbrella of the Tamil Nadu Leather Development Corporation ( TALCO) with financial assistance from both the Central and State governments, has been ''almost completed'', Mr. Hashim said.

He said with the commissioning of the project, for which 50 per cent of the investment has come from the tanners of the area, the perennial problem of treatment of effluents from tanneries would be solved. The plant at Vaniambadi would serve over 100 tanneries in the area, he said.

Mr. Hashim said that for the proposed common effluent treatment plants at Dindigul and Tiruchi, two other areas where tanneries are concentrated in Tamil Nadu, financial assistance from the government is yet to come. The problem of effluents of tanneries in the Pallavaram area would be tackeld by the Tamil Nadu Pollution Control Board, he said.

In Kanpur, Mr. Hashim said, the work on the project to treat tannery effluents there under the Ganga Action Plan with the Dutch government's assistance would commence ''very soon''. He said, in West Bengal, the state government is considering relocating all the tanneries around Calcutta about 40 kms. away from the city and that the effluent problem there could be solved only after relocation. These are the three states in the country which have mainly suffered due to the effluent problem.

## TASK FORCE SOON ON LEATHER INDUSTRY DEBT-EQUITY RATIO

A task force is to be set up soon by the Government to look into the question of liberalisation of the debt-equity ratio for the leather industry, according to Mr. M.M. Hashim, Chairman, Council for Leather Exports.

The task force is likely to include representatives of the Reserve Bank of India, leading banks, Government and industry. While the Council would be happy to have its representative, it would not press for it. In the event of being excluded, Mr. Hashim was confident of the banks presenting the industry's case in a just manner.

Regarding the Leather Modernisation Fund, Mr. Hashim said that the Rs. 500 crore proposal is awaiting the Planning Commission's approval and he was optimistic of the fund becoming operational soon.

## PHASING OUT FINISHED LEATHER EXPORT: QUOTA SYSTEM COMING

The Centre may soon come out with a policy decision imposing quantitative restriction on the export of finished leather.

A working group set up by the Commerce Ministry has recommeded a quota system, based on past performance, effective April 1, 1991, it is learnt.

The terms of reference of the working group included examining the question of "gradually phasing out" the export of finished leather in favour of total export of value-added products.
The group, however, is of the vi
a quota system with an automatic
ishing share will achieve the go
a period of time.

The Government's thrust on ex
more value-added products has a
seen, through a "phase-out" proc
exit of semi-processed leather
country's export basket from
this year. Though a similar m
contemplated in the case of
leather too, it has remained on p
the wake of a fierce debate on
in the industry circles.

The Government had, in fact,
proceeding along the line of its
ing by slashing benefits like CC
duty drawback available for
leather exports. This, coupled
mounting pressure on the Govern
put up by the products sector to
ban the export of the item, had up
manufacturers and exporters.

The products sector has been
plaining of shortage of leather
domestic market for conversio
products. The Pande Committee
as also a study of the Central L
Research Institute (CLRI) had
time ago, projected serious short
the domestic supply of hides and
in the years to come.

It is now estimated that the de
the supply of these raw materials
beginning of the Eighth Plan wi
the tune of 100 million sq.ft., whic
escalate to 200 million sq.ft. in
minal year of the Plan.

In the circumstance, the Gover
had recently allowed import o
hides and skins under OGL. But
not picked up to any appreciable
due to a host of reasons.

The finished leather lobby,
other hand, has been defending
at every forum armed with an a
facts and figures. For one, it is
that the projected shortage is o

We give leather the beauty treatment it deserves

For over 20 years, Colour-Chem has been helping tanners to change the texture of the leather industry with a wide range of quality leather chemicals. Tanning agents, fat liquors, binders, top coats, dyes and auxiliaries for special effects that ensure high standards. No wonder, most of the leading names in leather come to Colour-Chem.

Colour Chem

Chemicals that make the most of leather

to certain categories like bovine leather whereas there is a suplus in some categories like goat skin. Also, a few cheap items could only be exported in the absence of domestic demand.

Yet another line of defence is that the products sector in the country has not grown enough to absorb the entire domestic production of finished leather. Also, while the leather products are yet to find a firm foothold in the world market and remains content with a meagre share, the Indian finished leather attracts three-fourths of the world market.

The finished leather exporters are also worried about the loss of export benefits once they start diverting the leather to the domestic market. In this context, it is worthwhile to note that their association had once demanded "deemed export" status for supply of leather in the domestic market.

On another plane, they do not see any reason for imposing a ban on the export of finished leather as its share in the country's total leather exports has been steadily going down vis-a-vis products.

From around 70 per cent a few years ago, its share has come down to about 35 per cent last year, which includes a natural fall brought about by the gradual coming-of-age of the products sector.

The working group, it is understood, had weighed four options to restrict the finished leather export. They were: fiscal measures, physical restriction, fixation of minimum export price (MEP) and regulation through quota system.

It was felt that fiscal measures in the form of duty on export could not be applied on a uniform scale as some categories of leather should continue to be exported in good measure.

As for physical restrictions in the shape of banning export of certain types of leather and clamping duty on other categories, it was feared that such a step would attract retaliatory actions by importing countries like imposing discriminatory duty on products exported from Madras.

The group also was not in favour of fixing MEP as it was pointed out that there were many ways of circumventing such a regulation like under-measurement, etc. Besides, there is need for revising MEP frequently to keep pace with the fluctuating prices.

The quota system was found desirable as the quantity of leather available in different categories over the next few years could be easily assessed facilitating fixing of allocations to individual exporters. This will keep in check excessive export of leather from the country.

---

## LEATHER INDUSTRY MODERNISATION: Rs. 400-CR. FUND UNDER STUDY

A Rs. 400-crore modernisation fund for the leather industry is under consideration to upgrade leather producing units towards making finished leather goods too. This will fascilitate the phasing out of finished leather as announced by the government, and pave the way for value-addition before exporting.

The fund, proposed by the Council for Leather Exports (CLE) will, if approved, receive aid from an international financial body and will be available to leather units in the form of soft loans to modernise their factories and gear up for the phasing out.

Right now, the industry does not have the capacity to absorb all the leather being finished for product making. Apart from this, there are also other areas which have to be tackled before the phasing out of finished leather becomes a reality.

The marketing aspects of finished goods to be exported is a major hur
Product exports now rely on buyers
market them under their own br
names. Indian products don't go by
brand name, CLE officials say, and
will have to be created if exports ar
be sustained.

They point out the experience of
industry while shifting from expor
semi-finished leather to finished lea
During the change, Indian expor
found that their finished leather rec
manded a lower price than se
finished leather. This was because
their relative lack of expertise in
field and also because they could
compete with Italian finished leath

This could happen again in the c
of switching from finished leathe
leather goods, those in the indu
warn.

The phasing out itself may take m
than 10 years. Again taking the ex
ple of the phasing out of semi-finis
leather exports, the decision was ta
in 1973, but it was only this year
the industry could switch to export
finished leather.

The base year for reducing expor
finished leather is 1989-90. The fig
for this category in that year was
708.97 crores. This represented a ris
Rs. 91.1 crores over the 1988-89 fig
A 10-per cent cut on this will have
be effected in 1990-91, to begin w

---

## KENYA KEEN ON MORE JOI VENTURES

Kenya has sought India's
operation in production of cement,
tiles and machine tools. It has
invited Indian investors to invest
Kenya's proposed export process
zones and manufacture under b
through joint ventures. The Assist
Minister of Commerce of Ke
Mr. M. Barari Karingi, urged Indi
buy more semi-processed leather, h
and skins.

# Chemical News From Abroad

### EFIC WARNS OF CONTINUING UMP IN EXPORTS TO THE US

Although the general situation of the emical industry in Europe is good, ne problems are developing in the US ich are harming both exports and mpanies with operations there, rned Dr Gunter Metz, president of fic, the European federation of chem- l industry associations, at its general sembly in Paris. The driving force hind demand was from the domestic emical market rather than exports for fourth consecutive year.

"We are suffering because of the cur- ncy situation", he said, "We cannot y if exports will go up as there are no ear signs of recovery in the US yet".

According to Cefic, the expected 990 growth rate of 2.5 per cent for the emical industry in Western Europe is ly slightly below the 3 per cent crease of GDP and manufacturing dustry, and will be the industry's ghth consecutive year of growth. The ain reason for the current moderate owth expectation is the assumption of rther destocking during the first half the year due to low prices.

Capacity utilization should remain gh, and production should increase incipally in pharmaceuticals, bulk astics, and consumer-related products. rong competition in Europe has sulted in fast-growing imports, which e expected to increase by 6% com- ared to 9.9% last year. Exports will lso be down, from 5.2% to 3.5%.

Although capital investment is xpected to be below the last two years, 8.5 per cent it will remain strong. owever, Metz revoiced concerns of ossible overcapacity and said, "We ill still have periods of adjustment".

Metz emphasized the progress made ecently in environmental protection but the issue of eco-taxation remains a concern. Cefic, which is currently preparing a position paper on this matter, favours arrangements within industry rather than taxes imposed by the government, which only add to costs for the industry.

Although willing to contribute know-how to help solve the major environmental problems in Eastern Europe, the chemical industry cannot take responsibility for the finance required, said Metz. "This must certainly remain the national responsibility of the state governments," he said. Furthermore, there was no complete halt to the export of waste from Western to Eastern Europe, he said, although this had been limited.

Although both the Polish and Hungarian chemical industry associations have applied to join Cefic, Dr Hugo Lever, Cefic director general, said this was not yet possible as they have not organized themselves in a way which makes them really representative of their respective national chemical industries. However, he envisaged they might join within the next five years.

The decision by the EC to begin negotiations to achieve a free trade agreement with the Gulf Cooperation Council (GCC) countries was "very unfortunate", said Metz. "I believe that the interests of the Western European petrochemical industry have in fact been sacrificed as a result of political pressure," he said.

Cefic still hopes to delay the process of negotiations, added Metz, but "we have a constructive dialogue with GCC countries which will lead to a mutual improvement in understanding each others' problems. We are trying to talk at the same time as trying to delay" explained Mike Cockburn, Cefic's director for petrochemicals/energy. In any case, "many problems" remain to be solved in the present Gatt round which ends this November, said Metz. Metz also stressed the priority Cefic has given to biotechnology, which "will become a driving economic force in the next century". Its senior advisory group has produced a document setting out Cefic's position on the regulation of bio-tech activities in Europe.

Finally, Metz said efforts to keep the general public fully informed of the industry's activities and achievements should be redoubled in order to win their confidence and support. "For our industry, the 1990s "must be the decade of communication".

### FoE ATTACKS ICI

Friends of the Earth have branded the Homecare range of ICI cleaning products, which are labelled as environmentally friendly, as a "green con". They claim the manufacturing process is extremely polluting. However, ICI has confirmed that it plans to remove the labels from the range, saying this was an internal decision not prompted by pressure from the group.

Commenting on the products, Blake Lee Harwood, water pollution campaigner for Friends of the Earth, says the products, which are manufactured at ICI's Winnington plant, Cheshire, U.K., are based on soda ash. He claims that the liquid discharge from the plant is so polluting that it downgrades the river Weaver from class 2 to class 3.

ICI says the products are based on sodium bicarbonate or soda crystals which is why they had the label. The company has since recognized the other aspects, hence its decision to remove the trademark.

### SCHERING SEEKS JV IN THE US OR JAPAN

Schering is known to be talking with a number of US and Japanese companies with a possible view to finding a partner for its agrochemicals business.

This follows the breakdown of its planned tie with Sandoz. The Berlin-based company has also been approached by other European companies after it was announced that no agreement would be realized with Sandoz, confirmed a Schering spokesperson. However, this was a natural situation and any other possible negotiations are still at an early stage.

Meanwhile, rumours were heard in the London financial markets that Sandoz has acquired some shares in Schering, but neither company could confirm this. Market observers do not discount this possibility, nor that Schering could be looking at Roche's plant protection division, Maag, which is up for sale.

## BP/MONTEDIPE DEAL

BP Chemicals has agreed in principle to take over the acetylene, acetaldehye and acetic acid derivative business of Enimont's Montedipe. Not included, however, is the polyviny lacetate dispersion business, which will be managed, as before, by Enimont.

The proposed deal provides for Montedipe to continue to be responsible for the manufacture of the products for BP at the plants in Priolo and Porto Maarghera, while BO Chemicals will take over the supply of the product to Montedipe's customers.,

The plants produce 50,000 ton/year ethyl acetate, 15,000 ton/year butyl acetate, 65,000 ton/year vinyl acetate and 90,000 ton/year acetaldehyde, said a BP Chemicals spokesman. BP Chemicals is making the move in order to protect its own acetic acid business, which supplies the Montedipe plants, as Enimont regards these as strategic.

## ICI STUDIES JVS

ICI's wholly-owned subsidiary Chemicals and Polymers (C&P) is looking at a number of joint ventures and alliances with operations in Eastern Europe. According to ceo Dick Lindsell, "there are opportunities out there, but they will have to be worked at very hard". However, he cautioned that while the opening up of Eastern Europe has increased the number of opportunities in Eastern Europe, "they won't fundamentally alter the nature of C&P."

Lindsell said the areas of possible collaboration concern "niche areas where C&P has specific strengths". These are likely to include its methanol, ammonia and brine electrolysis technologies and specific marketing and product experience.

## TOTAL CHIMIE AIMS TO BE AMONG MARKET LEADERS

With the formal acquisition of Orkem's specialities due to be completed in mid-July when all the administrative hurdles have been cleared, Total's ceo Pierre Vaillaud outlines his ambitions for what is now France's third largest chemicals group. "We aim to be the leader in Europe in each of our business segments," he stated outright. Geographic expansion into Eastern Europe, South East Asia and North America is also a principal aim.

Total Chimie's sales will amount to FF20bn ($3.5bn) this year. Already, Hutchinson's rubber products rank second in Europe (excluding the tyre industry) with sales of FF7bn. Resins and inks, each with FF4bn sales, as well as adhesives, with FF2bn sales, rank third in the European market.

However, the paint business, although among Europe's top ten, holds only eighth or ninth place. "Except for anti-corrosion paints, where we can aim for the top place, other paints are specific to each national market", said Vaillaud. In light of this, Vaillaud is casting around to find, in the short term, new business in anti-corrosion paints through acquisition.

Geographically, 79 per cent o
group's sales are focused in we
Europe, with France accounting f
per cent. North America make
12-13 per cent and the balance of
cent is scattered throughout the re
the world. Jacques Lelievre, pres
of Hutchinson, which is Total Chir
original base, is eyeing expansion c
sector in Eastern Europe from the 2
cent sales base the company has in
Germany.

The FF100m revenue Hutchi
currently makes in Eastern Europe
be expanded "little by little" in
but also in production there. But the
area of development, said Lelievre,
be Western Europe — Germany, I
Spain and the UK — where the gro
sales bases are still too narrow.

The same philosophy applies to T
Chimie's other businesses. Vail
sees the eastward move beginning
Hungary where light industry is n
developed than elsewhere in Eas
Europe, followed by Czechoslova
East Germany and then the So
Unions.

Concerning the split between Elf
Total of Orkem's assets, deputy gen
manager of Total Chemie Jean-Pi
Seeuws said it was now complete o
industrial, structural and marke
basis.

There remained the more com
matter of fiscal arrangements invol
the 170 companies which now mak
Total Chimie.

## FERRUZZI IN BRAZIL?

Brazilian Government sources
that Italy's Ferruzi group has plan
invest $1.3bn in Brazil to expand
diversify its range of operations th
Backing up this view industry sou
in Brazil say Ferruzzi's chairman
Gardini has revealed his plans to
country's President Collor. Monted

was unable to confirm this, however. There is much speculation on the Brazilian market on what targets the Italian major could be aiming for and one likely acquisition could be the household cleaning products firm Bombril, a family concern with management problems. One industry source said negotiations for the Ferruzzi group to acquire the company for $250m are underway.

In an attempt to reinforce its position and reach $300m turnover by 1992 Bombril is considering making a $60m investment. Part of this is expected to go the chemicals division at Aratu, Bahia state, to produce powder detergents.

All of Ferruzzi's petrochemicals operations are via Himont, which has a 33 per cent stake in PPH, a major PP player in the Triunfo complex. PPH produces 90,000 ton/year of PP and has a 260,000 ton/year expansion underway.

## AL LOOKS EAST

Air Liquide's president Edouard de Royere has said the company will pursue a vigorous policy of penetration in Hungary, West Germany and Czechoslovakia.

The group is also currently studying the Polish market to analyse how it will evolve. Gas is produced on a self-contained basis in combines, as is the case in East Germany. So, Royere expects this market to open up because of the need for more sophisticated technologies, but added that the group was adopting a step-by-step approach. "The important thing is to take a toehold while keeping investments low for the time being," he stressed.

Meanwhile, Air Liquide and Degremont have created a common company to manufcture and sell ozone generation systems. The new company will be active on a global basis. The company's first move has been to purchase the Asea Brown Boveri group's technical and sales activity in the field of ozone and high density UV generators.

## GENETECH OKAYS ROCHE TRANSACTION

Genentech Shareholders have voted 97 per cent in favour of the $2.1bn agreement with Roche Holding in which the Swiss company will take a 60 per cent stake in the US biotechnology giant. Roche will invest around $492m in capital in Genentech.

Previous to the stockholders' vote, a Delaware court denied a motion for a preliminary injunction to enjoin the vote on the proposed merger.

The plaintiffs claimed the company and the board did not provide full disclosure of information to shareholders before asking them to vote.

Roche has expressed its satisfaction with the outcome of the vote, but final approval is still required from the US federal trade commission, which has requested further information on the proposed merger because of antitrust questions.

## MAUSER WINS AWARD

West Germany's Mauser-Werke has been awarded the 1990 Cefic environment award for its optimally drainable steel drum. The Ecu 25,000 ($30,000) prize has been awarded every two years since 1988 for an outstanding innovation which enables the chemical industry to improve its environmental performance.

Mauser's 55-gallon drum enables an additional 1 litre of product to be emptied, therefore helping to prevent residue requiring disposal as hazardous waste. With 51m drums filled and emptied each year in Europe alone, this, would represent a reduction of 51,000$^{3}$/year of hazardous waste, said Mauser's director Dr. Marten Burgdorf.

## NORDIC COMPANIES COOL INTEREST IN EAST EUROPE

Problems with financing, cro border movement of capital and obta ing reliable raw material supplies ha combined to cool Nordic interest developing business interests in E Europe. Of these 1,500 East/West ve tures signed, 308 involve Nordic co panies.

Many Nordic chemical and pharm ceutical groups, in particular, Finland Kemira, Neste and Nokia, already h long-standing trade contacts with Ea ern Europe prior to the arrival of pe estroika and the drafting of joint ventu structures in 1987. They believe th close proximity to the Soviet Union a enduring contacts with Eastern Euro provide them with a clear edge ov other Western groups in completi successful joint ventures.

This is tinged with caution at preser however. "Overnight results are n possible in Eastern Europe: caution essential. One must always rememb the basics, the fundamental obstacles doing busines in countries where the are always shortages of essential su plies," said a Swedish chemical con pany director.

Neste is one of the few Nordic chem ical companies with a long-term Eas ern European strategy. It is part of Western consortium headed by Com bustion Engineering now building a pe rochemical facility in Tobolsk, Wester Siberia, and has signed a series of joi venture deals in neighbouring Latv and Estonia. Others are in negotiatio in Poland and Lithuania, and Hunga ian joint ventures are also possible.

Although Kemira has been negotia ing the sale of chemical processing an water treatment technology since th mid-1980s, it has stopped short c investing in production facilitie because of the uncertainty surroundin access to raw materials. "The most intractable problems are caused by the difficulties in the purchasing and financing of operations using convertible currencies," said Ludmila Rodnina, an expert on East-West joint ventures at the Comecon Research Institute. "The whole question has been left unresolved. Joint ventures have had to devise their own methods of acquiring supplies as they are not included in the Soviet state purchasing system," she added. Expansion into Eastern Europe is on the cards for more Nordic chemical companies: Nobel, Kemira, Danisco, Dyno Industrier, Norsk Hydro and Fermenta.

## ATOCHEM'S PLASTICS LOOK UP

Atochem's Engineering plastics sector is boosted by its merger with Orkem's polymethyl methacrylate (PMMA) production (Altulor, Casolith and Vedril). This will give the division an additional FF1.5bn ($263m) sales and a total production capacity exceeding 80,000 ton/year in France, Italy, West Germany and the Netherlands. Atochem will gain a leading position in Europe with one third of the PMMA market. In all, Atochem's engineering polymer sales now exceed FF4bn worldwide. The acquisition of Pennwalt has also enlarged the range of engineering plastics with the emphasis on fluorine polymers (PVDF) and a world position.

Bullish about this sector, which accounts for one-third of Atochem's sales, president Jacques Puechal does not consider the situation of the remaining two-thirds base chemicals, as "catastrophic". The first five months of 1990 were "not as good as the first half of 1989, which was brilliant", he said, "but they were satisfactory."

Concerning Enimont's stated wish to exercize its purchase option on the Dunkirk cracker, Puechal said his group was debating whether or not to maintain" "a certain presence" in the cracker, in view of this fact. Puechal also indicated that the US chemical company Engelhard wishes to set up a joint affiliate with Atochem for the manufacture of chemicals for metallurgy. The venture would be 60 per cent Atochem and 40 per cent Engelhard.

## DU PONT FADES ACRYLIC FIBRES

Du Pont will phase out its Orlon acrylic fibres business, which it says has not been profitable for a number of years. According to analysts at BZW, Du Pont is to close the two US plants, the first of which will shut immediately. As a result, US acrylic capacity is expected to drop by 100 000 ton/year, which BZW says will offer export opportunities to European producers.

Director of the group's textile division, Paul Gillease, said, "significant overcapacity, with was partially attributed to high impact growth and consumer preference for polyester and cotton in traditional end-uses, has eroded the acrylic fibre business. He said the phaseout will have no effect on its global arcylonitrile business, remaining confident of maintaining supplies.

Source say that Orlon reported sales of about $200m last year, and total fibre sales by Du Pont, including those of nylon, were $5.97bn.

## EC REPS MEET GCC

Inudstrial executives from the EC and the Gulf Cooperation Council (GCC) countries were scheduled to meet in Brussels for a new round of discussions on trade and investments.

This was the third such gathering this year to discuss the effects of EC-GCC government trade talks on the plastics and petrochemical industries of both regions.

Available with MODVAT benefits

CALCIUM CHLORIDE

ANHYDROUS - 98%
ANHYDROUS - 95%
FUSED (POROUS) - 80-85%
FUSED (HARD) - 75-80%
LYE - 35-40%

Please Contact Manufacturers:

SAMEER CHEMICALS

C-1/42/17, GIDC, Nandesari,
Dist. Baroda 391 345.
Tel.: 60264

# Chemical Markets Abroad

## FIRE FORCES SHUTDOWN OF SHELL'S UK PP CAPACITY

Shell Chemicals UK declared force majeure on polypropylene deliveries from its Carrington plant, its only UK PP manufactutring site. This follows a fire which started in an extruder but spread swiftly. The 120,000 ton/year plant will be out for an unspecified period.

The fire severely damaged extrusion capacity and compounding facilities, although one source suggests that the reactor itself was not badly damaged. Shell states that the extent of the damage will not be fully known until investigating teams spend several days assessing the situation.

Shell is obviously exploring all possible alternative sourcing arrangement, particularly from other group sources on the Continent. Meanwhile, customers have been advised that interruptions to supply are inevitable and have been advised to consider contingency supply arrangemnets until further information can be provided.

In the current tight market, this will not be easy. European producers are operating at aroung 92 per cent of nameplate, said to be close to 100 per cent of achievable capacity. Producers' inventories are at historically low levels, and monomer shortages have disrupted production at some plants over the past four weeks.

One customer said he believed supplies could be interrupted for up to 12 weeks. The company had already been on allocation for product and the situation for UK converters appeared serious, with immediate sources of product difficult to locate, particularly in large quantities.

Shell's new 130,000 ton plant, due to begin commissioning in September, was undamaged by the fire and is independent of the old extrusion capacity. The new plant uses Shell's Lipp/Shac process. The damaged plant was due for partial closure of 60,000 ton/year of the old slurry capacity when the new plant was onstream.

In the meantime, ICI is left as the only polypropylene producer in the UK, with 150,000 ton/year capacity at its Wilton site.

UK polypropylene prices are below continental levels, but the shortages which could result from this outage, helped by sterling strength against the D-mark, could help raise prices. Shell's misfortune could provide a ready market for product from the new DSM plant at Geleen, now starting up.

Propylene feedstock for Shell's plant was partly sourced at Carrington, and partly supplied by pipeline from Stanlow. The polypropylene outage suggests that around 2,000 ton/week of propylene will now be available on the market, although the DSM start-up should theoretically redress the balance.

## GAS FEEDSTOCKS

Over the next decade, substantial resources of methane and ethane will be available for production of methanol, ammonia, olefins and derivatives. These inexpensive feedstocks will, however, be concentrated in relatively few regions: the Middle East, Indonesia, Malaysia, Venezuela and Argentina.

These regions will be in a position to manufacture derivatives globally on a competitive basis, as they face low extraction costs and lack significant alternative outlets. This is not the case for Canada, which can profitably export gas to the US market , or of North Sea

GLASS DISTILLATION UNITS

20 lit to 200 Lit. ALL GLASS DIST.
AND REACTION UNITS

WE MANUFACTURE

- HCL Absorbers Cascade Coolers Etc.
- Visible Flow Glass Pipeline Heat. Exchangers. Tee, Bends, Columns. Teflon Gasket, Metal Flanges, Etc. QVF Type upto 9"
- Quick Fit Type Interchangeable Laboratory Glass Appartus. Instrumemts and Appliances
- High Vacuum Gauges. Mercury Manometer & Switches.

LELE'S ALWAYS THE FIRST

★ In 1939 Late Dr. S.R. LELE World Known Glass Technologist Started M/s. I.E.A. to Manufacture Borosilicate Glass
★ In 1963 This Co. was reformed as BOROSIL GLASS WORKS LTD. for making CORNING GLASS.
★ In 1969 he started SILICA WARE P. LTD. to Mfg. Custom made Glass Equipment.

SILICA WARE (P) LTD.,
54-C CHOTANI ESTATE. PROCTOR ROAD
GRANT ROAD, BOMBAY: 400 007.
PHONE: 357442 GRAMS LELESIL
BOMBAY; MAHIM

Representatives:-
■ HYDERABAD: Mr. VINAY KUMAR
Plot No. 7, P & T. Colony.
Behind R.R. Labs. HYDERABAD.
Telephone: 853621
■ MADRAS: Mr. K. VAIDYANATHAN
Flat No. 10 2nd. Loop Str.
Tamilnadu H.B Colony.
Kotturpuram, MADRAS: 600 085.
Phone: 418758

UNIT NO. 2
92/B G.I.D.C. Nandesari Industrial Estate
NANDESARI Dist. BARODA. PHONE 60383
Baroda City(O.) ■ 322382 ■ Resi 320187

PRINT-DESIGN

production, faced with significant extraction costs. This situation is outlined in a new study by the consultancy Chem Systems. The report also highlights the growing importance worldwide of propane dehydrogenation. Methane and ethane producers in developed markets will suffer from increasing competitive disadvantage, but will face less competition from developing market producers of propane and butane.

## PIPELINE FOR MORRIS

Quantum Chemicals' polyethylene facilities at Morris, Illinois, were connected in early May to the company's ethylene plant at Tuscola. The new pipeline, Illini 2, transports feedstock for the production at Morris of ethylene glycol (136,000 ton/year), ldPE (245,000 ton/year), and lldPE. Production of the latter is being increased this month by 136,000 ton/year extra capacity, which will complement an existing capacity of 113,000 ton/year. Quantum announced the restart of its ethylene and derivative units at Morris at the end of May. The facility had been down since 7 June 1989 following a fire in the propylene purification section. A first attempt to restart the complex failed last September when a second fire, in the ethylene unit, halted operations again.

The Tuscola complex has recently been streamlined with the closure of 36,000 ton/year of ldPE, produced at Quantum's oldest and smallest unit (nameplate capacity 77,000 ton/year) for that product. Quantum has assigned $25m for the modernization of Tuscola's remaining facilities, which share local ethylene feedstock with the Morris derivative outlet.

## STAGNATION FOR FRG AGROCHEMS

Crop protection products in West Germany lifted turnover 6 per cent to DM4.68bn ($2.76bn) in the last financial year, according to the industry association, Industrieverband Agrar (IVA). Nearly two-thirds of sales (DM3.21bn) were outside West Germany and domestic sales (DM1.5bn) were 6.5 per cent higher than in 1988-89. Accentuating the trend towards more expensive, low dosage products, volume sales fell 4 per cent to 124,000 ton. The IVA said that output of heribicides and fungicides stagnated, as production of pesticides fell by almost 9 per cent.

Sales by fertilizer manufacturers in the IVA edged up to DM1.1bn in the fertilizer year 1988-89. Volumes of nitrogenous and phosphate product slipped back marginally, while consumption of potash fertilizers picked up. While consolidation in the fertilizer industry is continuing, crop protection producers are also having problems. The number of products registered fell to 1,024 in the first quarter of 1990 from 1,695 in 1987.

ICI

**ICI INDIA LIMITED**

ENNORE
MADRAS 600 057.

**CHEMICALS FOR DISPOSAL/SALE**

The following materials are available for disposal on "As is where is" basis

| | | | |
|---|---|---|---|
| 1. | PRENOL + TOLUENE | 12 DRUMS | 2220 Kgs. |
| 2. | METHYL DIMETHYL PENTENOATE (LOW STRENGTH) | 8 DRUMS | 700 Kgs. |
| 3. | CARBON TETRACHLORIDE + T-BUTANOL MIXTURE | 12 DRUMS | 2320 Kgs. |
| 4. | RECYCLED TRIMETHYL ORTHO ACETATE | 10 DRUMS | 1720 Kgs. |
| 5. | DISTILLED T-BUTANOL | 49 DRUMS | 7100 Kgs. |
| 6. | CARBON TETRACHLORIDE | | 6500 Kgs. |
| 7. | RECOVERED T BUTANOL | | 3401 Kgs. |

INTERESTED PARTIES MAY CONTACT DURING WORKING HOURS

# Biotechnology

## LAXO R&D PORTFOLIO: STRONGEST IN INDUSTRY''

Glaxo's recent R&D update, conrmed the strength of its new product ortfolio, considered to be about the rongest in the pharmaceutical indusy by investment analysts.

Indeed, Glaxo is considered a model'' pharmaceutical company for e 1990s, having key strengths in nancial resources, effective global arketing and a significant R&D pipene.

Over the last 12 months, Glaxo entred six new drugs for exploratory evelopment and advanced two from xploratory to full development. In addion, the routine evaluation of therapeuc benefit and safety, caused Glaxo to rop five drugs from exploratory and ne from the full developments stage.

Four drugs lead the development ipeline: sumatriptan, salmeterol, fluacasone and ondansetron, are considred significant advances on current herapies, if not major breakthroughs. he launch of these drugs will become e driving force for Glaxo's growth fter 1993, as approvals come through nd physician awareness builds up.

However, launches of new drugs ntail a heavy marketing cost in detailg the drugs to physicians. This seems kely to depress the rate of growth in e early 1990s. In addition, Glaxo may nd that defending its mainstay Zantac rom competition, particularly from stra's Losec, proves costly. Analysts uggest earnings may only grow by a ore modest 10 per cent in the next inancial year.

However, the total revenues for all rugs launched post-1989 is expected to each over $2bn to 1995, representing ver 30 per cent of group sales, accordng to analysts at Shearson Lehman Hutton. Much attention has been focused on sumatriptan, the drug for the prophylaxis and treatment of migraine, because no effective treatment exists for this condition. The problem has a relatively high prevalence-estimated to be 6 per cent in males and 12 per cent in females, with patients experiencing 12-15 attacks/year.

The potential for salmeterol, a treatment for asthma, should not be underestimated, according to certain analysts. Glaxo already has a dominant share in the anti-asthma market with Ventolin, which is now largely off patent. Salmeterol, a long-acting bronchiodilator, appears siginificantly better than Ventolin in terms of its symptomatic control, offers easier dosing, and has a similar side-effect profile.

Zofran (ondansetron), which was launched to fight nausea associated with cancer therapy, was developed in a remarkably short period-six and a half years from synthesis to first approval. It thus has about 15 years of patent life in most countries. Earnings from sales of ondansetron will grow as the drug finds further uses-such as the management of anxiety and the treatment of post operative nausea. Glaxo may have to adopt a different pricing structure for new uses because currently the drug is priced at a premium.

Finally, of the four drugs, the potential for fluticasone, an inhaled steroid for seasonal rhinitis and asthma, seems to have been overlooked, despite its very low potential for side-effects. The need to treat inflammatory problems in asthma is receiving more attention and this is expected to ensure it becomes a major product.

## GENENTECH DNASE ENZYME FILED

Genentech has filed an FDA investigational new drug application for an enzyme which may help the management of crystic fibrosis. The company aims to begin human clinical trials soon for DNase, a mucus dissolving agent. Depending on the genetic population, cystic fibrosis appears to affect between 1 in 1,600 and 2,500 new-born children. The disease is the most common genetic disorder and sufferers have an average life expectancy of about 26 years. It is characterized by persistent thick mucus secretions which block the lungs, the thickness being due to the large amounts of extracellular DNA, released by inflammatory cells.

Preclinical trials have shown DNase, a genetically engineered form of an enzyme derived from cow pancreas, to dissolve these secretions. The enzyme was used to treat the disease in the 1950s but was discontinued due to allergies.

A French diagnostics company, Bioprobe Systems, has developed a quick blood test for one of the gene mutations that can cause cystic fibrosis. It can identify 70 per cent of individuals at risk of bearing children with the disease. It detects the Delta F508 mutation and hybridation gene, first identified in 1989 by scientific teams at the Sick Children's Hospital in Toronto and Michigan University.

Controversy has arisen in France because the test, by identifying only carriers of the Delta F508 gene mutation, can only identify 49 per cent of couples who can pass on the disease.

Some medical opinions suggest the test should be restricted to families believed to be at risk.

## CETUS PURSUES IL-2 FOR CV THERAPY

Cetus has formed a research collaboration and licensing agreement with Masonic Medical Research Laboatory (MMRL) of Uttica, New York, covering the use of immune system factors for the control of hypertension.

The licence agreement covers MMRL's patent rights to the therapeutic use of interleukin-2 (IL-2) and gammma interferon. Cetus, a Californian biotech company, holds worldwide rights to this research and a commercial option. The company manufactures genetically engineered IL-2 as Proleukin.

Scientists at MMRL published results of their studies of IL-2 in the control of hypertension in a spontaneously hypertensive rat (SHR) model, in January this year. Writing in the journal Hypertension, Drs Richard Tuttle and Devendra Boppana described prevention of the onset of the disease in maturing rats and reducing blood pressure to normal in the SHR rat.

On the basis of these pre-clinical findings, human studies were begun at the State University of New York Health Sciences Centre at Syracuse. The trials ares soon expected to expand to include European medical centres.

The mechanism that causes immunologic functions to influence blood pressure is not understood, but scientists believe that better understanding will lead to the treatment of other conditions with immune system mediators.

Separately, Cetus scientists have described the use of IL-2 in conjunction with alpha interferon, as a treatment for advanced kidney cancer at the American Society for Clinical Oncology. Results from trials of the two drugs in combination, showed a higher rate of cancer regression than with IL-2 alone.

## ALZHEIMER'S DISEASE RESEARCH VENTURE

Schering-Plough has agreed to provide $20m of research support to Cephalon, a neuroscience research company based in Pennsylvania, US to support development of potential drugs to treat Alzheimer's and other neurodegenerative diseases.

The agreement provides for a wholly-owned subsidiary of Schering-Plough to receive exclusive worldwide rights to products and technology developed within the programme.

One of the two approaches outlined in the agreement, is to regulate the specific genes in the nervous system which will affect the development of nervous system diseases. The second approach is to prevent the formation of amyloid plaques, which occur in Alzheimer's disease, by inhibiting a protease called clipsin.

The discovery of clipsin was described by a Cephalon scientist in a recent paper in the Journal of Biological Chemistry.

## EUROPE'S BIOTECH EFFORT IS FALLING BEHIND, SAYS SAGB

Europe is falling behind in biotechnology competitiveness, according to the European chemical industry federation's senior advisory group for biotechnology (SAGB).

In a new publication, Community Policy for Biotechnology: Competitiveness and Economic Benefits, the SAGB notes that in 1989, the “overwhelming majority” of biotechnology investments went to the US, many having originated in Europe.

“For start-up ventures in biotechnology-the surest indicator of technological dynamism and future competitiveness-the US is the undisputed choice of biotechnology entrepreneurs”, it says.

Only 19 per cent of recently documented biotechnology patents worldwide were granted to Europeans, compared with 41 per cent for Americans and 36 per cent for the Japanese, according to the SAGB.

“Ignoring-or trying to stop-the worldwide biotechnology revolution is not a policy option for Europe”, according to SAGB chairman, Dr. Peter Doyl of ICI.

In order to take advantage of th world market for biotechnology-base products, currently estimated at Ecu5b ($6bn) and projected to increase to som Ecu80bn by the year 2000, Europe mus “harness biotechnology through dialogue, education and training, and supportive policies”, he said.

Market penetration will take place i core sectors of the European economy particularly pharmaceuticals, chemical agriculture, food and environmenta management. The SAGB was set up b Cefic in June 1989. Its founding memebers were Ferruzzi, Hoechst, ICI Monsanto Europe, Rhone-Poulenc Sandoz and Unilever.

US biotechnology companies coul set up production in West German under the country's new Genetic Technology Law, which comes into effect o 1 July this year, according to a surve carried out recently by the consultanc company, RauCon of Heidelberg, Wes Germany.

The survey found that a wide rang of genetically-engineered healthcar products such as Genentech's tissu plasminogen activator (tPA), Biogen' interleukin-2 or Amgen's erythropoietin (EPO) could, in future, be manufactured without the need for productio plants to be disclosed or a public hearing to be held.

The production processes for products of this type would be classifie under safety level 1, because the involve organisms, which are “generally regarded as safe”, according t RauCon.

Under this classification, the Wes German authorities would be obliged t approve production processes within 3 months of a company's application provided safety standards were met.

# Environment

## DU PONT SET TO REPLACE IALONS

Du Pont has developed two potential alternatives to halon fire extinguishants 1301 and 1211, which have been linked to the depletion of the stratospheric ozone layer.

The first product, FE-25, is intended as a replacement for halon 1301 and has zero ozone depletion potential (ODP), according to Du Pont. The second, FE-232, is expected to be used as a replacement for halon 1211. Its ODP is said to be less than one-hundredth of that of halon 1211.

The ODP of the halons is 3-10 times greater than those of fully halogenated chlorofluorocarbons, Du Pont notes. Halon 1301 is used as a total flooding agent for fire protection in areas such as hospitals, aircraft, ships, computer rooms and oil production facilities. Halon 1211 is mainly used in portable fire extinguishers.

The main ingredient in FE-232 is the hydrochlorofluorocarbon, HCFC-123, which will be produced commercially by Du Pont Canada at its facility in Maitland, Ontario. FE-25 contains the hydrofluorocarbon, HFC-125, which is to be manufactured in small quantities at a pilot facility in Deepwater, New Jersey.

The newly-developed substitutes have shown favourable results in preliminary testing, and will soon be ready for "extensive industry evaluation and approval" before they are used more widely. While the products are "the best candidates to date that perform similarly to the halons they will undoubtedly cost more to produce and require more product for comparable effectiveness in use", according to halon sales manager Alfred F Dougherty.

Test quantities of FE-232 are available for customer evaluation; the company expects FE-25 to be ready for evaulation in 1991. It anticipates that they will be "broadly available" in the 1995, provided that the results of toxicity tests are favourable.

The company estimates that global production of halons amounted to around 180,000 ton in 1989, and that halon 1211 accounted for around 60 per cent of this figure. Du Ponts joins Great Lakes Chemical with its announcement of halon alternatives. The latter company revealed last month that it was applying for EPA approval for Fire-master 100, claimed to be a potential replacement for halons 1211 and 1301.

## CROP PROTECTION AID

British technology group has reached an agreement with Rothamsted Experimental Station in the UK to fund a crop protection research programme, aimed at developing "environmentally friendly" pest control agents. BTG will fund a team of scientists at a cost of £200,000/year.

Under the agreement, BTG will have first refusal on rights to any chemical inventions relating to crop protection which originate at Rothamsted over a five-year period. BTG will be responsible for licensing any acquired technology to the agrochemical industry. Research will initially be targeted at developing insecticides, semiochemicals, phloem-mobile compounds and miticides.

In the insecticide sector, new pyrethrin analogues with activity against resistant pests will be investigated. The programme will also look at analogues which are harmless to fish, which would be suitable for use against insect pests of rice. Various plants will be analysed as potential sources of new products. New analogues of insect neuropeptides will also be tested.

Further research is planned into phloem-mobile fungicides and other products, which, when sprayed on to a plant's leaves, migrate into new plant tissue and into the roots to control soil borne pathogens and other pests.

## CZECHS TO CUT CFC USAGE

Czechoslovakia's largest CFC user, the Usti nad Labem Chemical and Metallurgical Works in Velveta, northern Bohemia, plans to phase these products out completely by 1994. The company is said to account for one-third of total CFC consumption in Czechoslovakia. Current estimates suggest that the Czechoslovak chemical industry produces some 2,000 ton/year of CFC's, and that nation wide use of CFCs amounts to about 7,000 ton/year.

The central Bohemian Kralupy and Vitavou Chemical Works is reported to have already substituted hydrocarbon propellant gases at the manufacturing plant. In addition, a paints and varnishes operation is investing some $2m (at the non-commercial exchange rate) on factory reconstruction aimed at replacing CFCs.

Czechoslovakia's draft environment protection law has to date undergone seven revisions. It is hoped that the law will be approved this year and will take effect from January 1991, although some observers comment that the target date of late 1991 would be more realistic.

## R-P INTRODUCES ITS WASTE INDEX TO UK

Rhone-poulenc has developed an index which assesses the environmental impact of each of its UK manufacturing sites. The index is currently in use at four major sites (Norwich, Dagenham, Belvedere and Staveley) and is scheduled to be introduced progressively at the company's other locations.

Developed initially in France, the

company believes that its index is unique in the UK. The index uses two sets of calculations. The first is for aqueous effluents destined for waste treatment or water disposal; the second is for hazardous solid or liquid waste to be disposed of via landfill or incineration. A method to assess gaseous emissions has not yet been developed but is under review, according to company technical director, Dr. Richard Templeton.

For aqueous effluent, the weight of a particular material produced is calculated on a kg/day basis. A multiplication factor is applied to this according to the degree of environmental impact. The range of substances reviewed so far includes dissolved salts, suspended solides, unoxidized nitrogen and soluble phosphorus.

For solid and liquid waste leaving the sites, the daily volume in kg/waste stream is recorded, and an appropriate multiplication factor applied. This technique producess a number for each type of waste. These are added together to give the "gross pollution equivalent"/-month, which is expressed as a percentage of the average monthly value for the previous year to create the monthly environmental index.

## AMERSHAM, M&S LINK FOR FOOD TEST R&D

Healthcare and life science products company, Amersham International has reached a research agreement with UK retailer Marks and Spencer covering the deveopment of rapid tests for confirming the absence of pathogens in food. The research is to be carried out at Nottingham University (UK); its primary aim will be to develop a rapid test for Listeria.

The research will also receive funding from the UK Department of Trade and Industry, under its joint industry and government programme, Link.

This money will be used to expa a research project to develop a meth for the rapid detection of pathogens food. The project already receives so funding from the DTI.

Companies involved include Ame ham International, Express Foo Campden Food & Drink Resear Association and Nottingham Unive sity.

Work underway involves the deve opment of methods for the detection specific bacteria through their emissio of light (in vivo bioluminescence); suc methods are said to be rapid and high sensitive.

Nottingham University is carryin out research on the generation of high-light expression system for Li teria, which would allow bacteria to b detected at very low levels in food.

**"SRL" HIGH PURITY RESEARCH CHEMICALS & REAGENTS CONFIRMING TO INTERNATIONAL STANDARDS**

**"SRL" RANGE INCLUDES**

- BIOCHEMICAL REAGENTS
- CARBOHYDRATES
- ENZYMES
- PLANT GROWTH PROMOTERS
- SCINTILLATION CHEMICALS
- SOLVENTS AR/SPECTRO/HPLC GRADE
- BIOLOGICAL BUFFERS
- ELECTROPHORESIS REAGENTS
- ORGANIC INTERMEDIATES
- REAGENTS FOR MOLECULAR BIOLOGY
- SEPARATING MATERIALS
- & SELECTIVE RANGE OF SPECIAL REAGENTS

Ask for our latest price list of 800 Biochemicals & Reagents

SRL

SISCO RESEARCH LABORATORIES PVT. LTD.
2-F Satam Indl. Estate, C-Wing,
Dr. Cardinal Gracious Road, Chakala, Andheri (E),
BOMBAY 400 093 (INDIA).
Telephone : 632 3882 Grams : INNOVATION, Bombay 93.

STOCKISTS WANTED IN UNREPRESENTED AREAS IN THE STATES OF BIHAR/M.P./RAJASTHAN/U.P./ORISSA/A.P./KARNATAKA/W.B./ MAHARASHTRA/T.N./ASSAM/KERALA. FINANCIALLY SOUND & INFLUENTIAL PARTIES PLEASE APPLY

# MARKET INFORMATION

## Market Steady

The Bombay market remained more or less steady. There was an acute shortage of propylene glycol which is expected to go up. Even sodium nitrite was in short supply. With HOC raising prices of ONCB, related user product prices are expected to move up. Acute shortage of dihydrothio PTOS (imp) pushed prices up by Rs. 300 to Rs. 1,300 per kg.

**We cannot guarantee the accuracy of the prices published in CHEMICAL WEEKLY as they are based only on the enquiries made by our correspondent -- and, as such they are not FIRM PRICES as between a buyer and seller. The prices are published only with a view to giving some ideas of the market conditions.**

**The prices are inclusive of Excise and Maharashtra Sales Tax.**

**(Prices as on July 24, 1990)**

| INDUSTRIAL CHEMICALS | Per Kg. |
|---|---|
| Ammonium sulphate | 2.50 |
| Ammonium phosphate (Mono) | 14.50 |
| Ammonium phosphate (Di) | 14.50 |
| Ammonium carbonate (Di) | 17.00 |
| Ammonium bicarbonate | 6.00 |
| Ammonium chloride | 3.25 |
| Ammonium nitrate | 6.00 |
| Arsenic white powder | 22+ST |
| Acrylamide (Resale) | 87.00 |
| Barium carbonate | 20.00 |
| Bleaching powder (33% Cl) | 5.00 |
| Borax (Granular) | 16.00 |
| Borax (Powder) | 22.00 |
| Boric acid (Tech) | 32.00 |
| Bisphenol-A | 75.00 |
| Butyl carbitol | 106.00 |
| Caustic soda (Flakes) | 11.50 |
| Caustic soda (Solid) | 12.00 |
| Caustic soda (Lye) | 10.00 |
| Calcium chloride 70% (Solid) | 3.25 |
| Calcium chloride 75-80%(fused) | 3.50 |
| Calcium chloride 36% (Anhydrous) | 5.00 |
| Calcium carbonate (precipitated) | 6.00 |
| Calcium carbonate (Activated) | 5.75 |
| Cobalt oxide | 550.00 |
| Cresylic acid | 62.00 |
| Camphor (Indian) | 105.00 |
| Cream of Tartar (Tech.) China | 70.00 |
| Citric acid (Belgium) (Resale) | 47.00 |
| Citric acid (Indian) (Resale) | 41.00 |
| Copper sulphate | 24.00 |
| Chromic acid | 63.00 |
| Ethylene urea | 58.00 |
| Ferric chloride (Lumps) | 9.00 |
| Ferric chloride (Anhydrous) | 20.00 |
| Glue flakes | 15.00 |
| Glue sheets | 6.75 |
| Gohsenol GH-17 | 131.00 |
| Hydro | 39+ST |

FOR YOUR REQUIREMENT OF

**PARA CHLORO PHENOL**
**ORTHO CHLORO PHENOL**
**MONO CHLORO PHENOL**
**DICHLORO PHENE**
**SULFURYL CHLORIDE**
**E.D.T.A.**
**MONO CHLORO ACETIC ACID (MCA)**
**ISOPROPYL BROMIDE**
**CAUSTIC POTASH FLAKES**
**POTASSIUM CARBONATE**
**NORMAL BUTYL BROMIDE (NBBR)**

Authorised Dealer of

**M/s. Standard Alkali,**
**M/s. Anupam Rasayan,**
**M/s. Odex Chemicals Pvt. Ltd.,**
**M/s. P.K. Velu & Co. Pvt. Ltd.,**

Please Contact:

**Shree Amruta Organics Pvt. Ltd.**

813, Raheja Centre, 214, Nariman Point, Bombay 400 021.
Phone: 240415, 243979, 2873680 Telex: 11 6053 SATC
4A-B, Trade Centre, Near Stadium House,
Ahmedabad 380 014.
Telephone: 462332

| | |
|---|---|
| Hyflosupercell | 28.00 |
| Hexamine (Resale) | 36.00 |
| Industrial Wax | 25.00 |
| Litharge | 40.00 |
| Lead Acetate (Tech.) | 39.00 |
| Lithopone | 32.00 |
| Magnesium chloride (Crystal) | 2.00 |
| Menthol crystal (Flakes) | 355+Ex+ST |
| Menthol bold | 425+Ex+ST |
| Menthol crystal cold | 395+Ex+ST |
| Magnesium carbonate (Japan) | 30.00 |
| Magnesium carbonate (Indian) | 26.00 |
| Maleic Anhydride (Resale) | 42.00 |
| Mercury (34.5 Kgs) | 11,500.00 |
| Nickel chloride | 110.00 |
| Oxalic acid (Resale) | 15.25 |
| Peppermint oil (Rectified) | 188+Ex+ST |
| Potassium carbonate (Indian) | 26.00 |
| Potassium carbonate (Imported) | 26.00 |
| Potassium bichromate | 38.00 |
| Potassium phosphate (Mono) | 34.00 |
| Potassium phosphate (Di) | 25.00 |
| Polyvinyl alcohol (No. 117) | 93.00 |
| Polyvinyl alcohol (No. 173) | 135.00 |
| Polyvinyl alcohol (No. 208) | 170.00 |
| Paraformaldehyde (Resale) | 20.50 |
| Phthalic anhydride 36% (Resale) | 33.00 |
| Pentaerythritol (Resale) | 49.00 |
| Paraffin wax | 22+ST |
| Rangolite (German) | 96+ST |
| Rangolite (Czech.) | 72.00 |
| Rangolite (China) | 54.00 |
| Sodium sulphate (Fine) | 3.75 |
| Sodium sulphate (Coarse) | 3.50 |
| Sodium sulphide 50-52% (Flakes) | 11.50+ST |
| Sodium sulphide 58-60% (Flakes) (TCL) | 25.00 |
| Sodium sulphide pure (Flakes) | 12.25 |
| Sodium nitrite (Resale) per 50 kg. | 1,200.00 |
| Sodium chlorite 80% (Spain) | 110+ST |
| Soda Ash (Tata) | 4.90 |
| Soda Ash (Birla) | 4.30 |
| Soda Ash (Imp.) | 4.50 |
| Sodium bicarbonate | 7.00 |
| Sodium bisulphite | 8.00 |
| Sodium silicate | 5.50 |
| Sodium acetate | 7.20 |
| Sodium alginate | 450.00 |
| Titanium Dioxide (Anatase) | 65.00 |
| Titanium Dioxide (Rutile -- $RCR_2$) | 88+ST |
| Tartaric acid | 190.00 |
| Trisodium phosphate | 12.00 |
| Thiourea | 78.00 |
| Urea (Tech.) | 3.00 |
| Vacuum salt | 1.00 |
| Zinc Dust | 52.00 |
| Zinc Oxide | 54.00 |
| Zinc chloride powder (Tech.) | 20.50 |
| Zinc sulphate | 7.00 |

| SOLVENTS | Per Kg. |
|---|---|
| Acetic Acid Glacial (Resale) | 13.00 |
| Acetic Anhydride (Resale) | 33.50 |
| Acetone (Resale) | 19.00 |
| Adipic Acid | 90.00 |
| Aceto Acetanilide | 55.00 |
| Aniline Oil (HOC) | 43.00 |
| Benzoate Plasticiser | 62.00 |
| Butyl acrylate | 80.00 |
| Butyl stearate | 38.00 |
| Butanol | 32.00 |
| Benzyl Alcohol | 60.00 |
| Benzyl Chloride | 34.00 |
| Benzo trichloride | 16.00 |
| Benzoyl chloride | 22.00 |
| Bromine Liquid | 68.00 |
| Chloroform | 30.00 |
| Carbon Tetrachloride | 20.00 |
| Cellosolve | 58.00 |
| Cyclohexanone | 64.00 |
| Cyclohexanol | 58+ST |
| Diacetone (Resale) | 26.75 |
| Diethyl Oxalate | 34.00 |
| Diethyl glycol (DEG) | 25+ST |
| Dioctyl Phthalate | 44.00 |
| Diallyl Phthalate | 41.00 |
| Dimethyl Phthalate | 28.00 |
| Dioctyl Adipate | 52.00 |
| Dibutyl Adipate | 42.00 |
| Dipentene | 15.00 |
| Dimethylamine 40% | 30.00 |
| Dimethylamine 50% | 35.00 |
| Ethyl Acetate | 16.25 |
| Ethyl Acrylate | 72.00 |
| Ethylene Dichloride | 18.50 |
| Ethylene Glycol | 32.00 |
| Formic Acid (Imp.) | 24.00 |
| Formaldehyde (Resale) | 6.75 |
| Glycerine (CP) | 55.00 |
| Glycerine (IW) | 54.00 |
| Hydrogen Peroxide 50% (Resale) | 35.00 |
| Isopropyl Alcohol | 26.00 |
| Isobutyl Alcohol (Resale) | 35.00 |
| Monoethanolamine (Resale) | 95.00 |
| Melamine | 60.00 |
| Methyl Ethyl Ketone | 38.00 |
| Methyl Isobutyl Ketone | 38.00 |
| Methyl Acrylate | 68.00 |
| Methylene Dichloride (Resale) | 16.50 |

FOR YOUR REGULAR REQUIREMENTS OF:

**Butyl Acetate**
**Octyl Acetate**
**Di Octyl Maleate**

Please Contact Manufacturers:

**VIKRAM CHEMICAL INDUSTRIES**

1218. Dalamal Tower, Plot No. 211, Nariman Point, Bombay 400,021.
**Phones: 230006, 231192, 233554, 233562**

For Competitive Import of Pharmaceutical Substances, Chemicals & Raw Materials and Particularly the following items:

ERGOT ALKALOIDS
SULPHONAMIDES
ANTIBIOTICS
AMINO ACIDS
INSECTICIDES
FUNGICIDES
HERBICIDES
RODENTICIDES
REPELLANTS
PHEROMONES
CARDIAC GLYCOSIDES
ANTI CANCER DRUGS
LITHOPONE, RANGOLITE
CAPROLACTAM
POTASSIUM & SODIUM HYDROXIDE
OXALIC ACID
ESSENTIALS OILS AND AROMATIC PRODUCTS
RUBBER CHEMICALS, CONVEYOR BELTS, RUBBER PROCESSING AGENTS

Please Contact Exclusive Representatives Of:

M/s. CHEMAPOL, CZECHOSLOVAKIA
M/s. N. JIVANLAL & CO. PRIVATE LIMITED
Rawat Manzil, 2nd Floor, 50, Shamaldas Gandhi Marg, Bombay 400 002.
Tel.: 251685/252527/253193 Tlx.: 011-3865 Gram: NIRANJAN

BILLY - PEOPLE WHO KNOW WHAT CHEMICAL PLANT AND PROCESS INDUSTRY IS ALL ABOUT!

Our Manufacturing Range:
* CENTRIFUGES
* EVAPORATORS
* CRYSTALLISERS
* BALL MILLS
* MULTI MILLS * HEAT EXCHANGERS * TRAY DRYERS
* REACTION VESSELS * DRUM DRYERS
* FILTER PRESSES, ETC.

Available under IDBI Deferred Payment Scheme

Designers, Engineers & Manufacturers
BILLY ENGINEERING ENTERPRISES
761, Thiruvottiyur High Road Madras-600 081. Phone ; 554619

HOT NEWS FOR AEROSIL USERS

The much-awaited import-substitute for AEROSIL/FUMED SILICA manufactured indigenously under German technical know-how

MICROSIL
(COLLOIDAL SILICON DIOXIDE - NF)

FOR USE IN: PHARMACEUTICALS & COSMETICS, PLASTIC REINFORCEMENT, PAINTS, ADHESIVES, RESINS ETC.

Contact Manufacturers:
LEUCHTSTOFFWERK (INDIA) PVT. LTD.
Phone: 224128 Post Box No. 2003. BOMBAY - 400 002. Gram: "GLOWORM"

| | |
|---|---|
| Carbitol | 64+ST |
| Meta Cresol | 45.00 |
| Nitrobenzene | 19.00 |
| Nitric Acid (Conc.) (RCF) | 2.50 |
| Ortho Cresol | 30+ST |
| Phenol (Resale) | 36.00 |
| Propylene Glycol | 52.00 |
| Polyethylene Glycol (No.200) | 58.00 |
| Polyethylene Glycol (No.400) | 65.00 |
| Polyethylene Glycol (No 500) | 52.00 |
| Polyethylene Glycol (No 1600) | 54.00 |
| Polyethylene Glycol (No 4000) | 80.00 |
| Polyethylene Glycol (No 6000) | 85.00 |
| Para Cresol | 110.00 |
| Styrene Monomer | 42.00 |
| Sorbitol | 14.00 |
| Sulphuric Acid | 2.80 |
| Trichloroethylene | 26.00 |
| Triethanolamine (Resale) | 85.00 |
| Turpentine Oil (Germany) | 8.00 |
| Turkey Red Oil (50%) | 20.00 |
| Vinyl Acetate Monomer | 52.00 |

| SOLVENTS | Per Litre |
|---|---|
| Benzene | 11.00 |
| N-Heptane | 10.50 |
| N-Hexane | 11.00 |
| Methanol | 8.50 |
| Solvent Naphtha Heavy | 10.50 |
| Solvent Naphtha Light | 8.50 |
| Toluene | 11.75 |
| Xylene | 22.00 |

## DYES INTERMEDIATES (PRICES ARE WITHOUT TAX AND EXCISE)

| | |
|---|---|
| Alphanaphthylamine | 65.00 |
| Alpha Naphthol (Imp.) | 155.00 |
| Aceto Acetic Ester (Methyl) | 65.00 |
| Ammonium Molybdate | 210.00 |
| Anthraquinone | 140.00 |
| Anthranilic Acid | 75.00 |
| 2-Amino 4 Nitrophenol | 140.00 |
| Blue B Base (Local) | 285.00 |
| Beta Naphthol (Atul) | 71.00 |
| Benzidine Dihydrochloride (BDH) | 80.00 |
| Bromamine Acid | 445.00 |
| BON Acid (Incl. of excise) | 140.00 |
| Chicago Acid (Atul) | 355.00 |
| Coach Acid | 52.00 |
| C Acid (Imp.) | 210.00 |
| Cyanuric Chloride | 155.00 |
| 2,4- DNCB | 27.00 |
| Dihydrothio PTOS (Imp.) | 1 300.00 |
| Dimethyl Aniline | 65.00 |
| Diethyl Aniline | 145.00 |
| Diamino stilbene disulphonic acid | 155.00 |
| 3,3-DCB (Imp.) | 200.00 |
| Gamma Acid (Atul) | 205.00 |
| H. Acid (Atul) | 95.00 |
| G. Salt | 70.00 |
| Isophthalic Acid | 50.00 |
| J. Acid | 330.00 |
| J. Acid Urea | 440.00 |
| K. Acid | 110.00 |
| MPDS (German) | 185.00 |
| MNA | 130.00 |
| Meta Ureido Aniline | 175.00 |
| MPD (Local) | 160.00 |
| MPD (Japan) | 180.00 |
| Naphthenic Acid | 46.00 |
| N-Methyl J. Acid | 525.00 |
| N-Methyl Aniline | 120.00 |
| Naphthalene (Refined) | 24.00 |
| Ortho Anisidine (OA) (Imp.) | 112.00 |
| Ortho Dichloro Benzene (ODCB) | 18.00 |
| OT Base | 125.00 |
| Para Dichloro Benzene (PDCB) | 28.00 |
| Para Anisidine (PA local) | 130.00 |
| PNA | 90.00 |
| Para Cresidine (Imp.) | 380.00 |
| Para Amino Azo Benzene (India) | 135.00 |
| PNCB (HOCO | 58.00 |
| Para Amino Acetanilide | 200.00 |
| 1-Phenyl 3 Methyl 5-Pyrazolone | 140.00 |
| Phenyl J. Acid | 350.00 |
| Para Amino Benzoic Acid | 135.00 |
| PT Base | 135.00 |
| Rhoduline Acid | 520.00 |
| Resist Salt 80% | 23.00 |
| Resorcinol | 230.00 |
| Sodium Naphthionate | 65.00 |
| 5-Sulpho-Anthranilic Acid | 78.00 |
| Sulphanilic Acid | 33.00 |
| Sulpho Tobias Acid | 145.00 |
| Trichloro Benzene (TCB) | 22.00 |
| Tobias Acid (Imp.) | 138.00 |
| Metanilic Acid | 43.00 |
| MTD | 125.00 |

We Manufacture Chemicals For Industrial Use

- Acetic Acid
- Acetic Anhydride
- Acetaldehide
- Industrial Alcohol
- Monochloro Acetic Acid
- Ethyl Acetate
- Butyl Acetate
- EDTA
- NTA
- Carboxy Methyl Cellulose

ASHOK ORGANIC INDUSTRIES LTD.
406.Sharda Chambers. 33.Sir Vithaldas Thackersey Marg (New Marine Lines).Bombay-400 20
Phone : 252236 : 252256 : 317511 Gram : 'ASHOKBROS' Telex : 11-3853 AOIL IN

Also Please Contact:

Baroda : Phones : 324519-325769
Telex : 0175-597 AOIL IN
Ahmedabad : Phone : 78009
Ankleshwar : Phone . 2461-2462
Telex : 0189-238 AOIL IN

New Delhi : Phones : 5710[illegible]-5711057
Calcutta : Phones : 282474-282475
Telex . 021-7917 SBIL IN
Madras : Phone . 582046
Telex : 041-7527 SBIL IN

Bangalore : Phones: 570746-570760
Telex : 0845-8275 SBIL IN
Hyderabad : Phones : 73737-831049
Poona : Phone: 50797

Plants at : Nandesari - Baroda; GIDC Ankleshwar; Boridra - Bharuch

A HOUSE FOR SOLVENTS & CHEMICALS

- * ACETONE
- * S.B. TOLUENE
- * ETHYL ACETATE
- * N-HEXENE
- * ORTHOXYLENE
- * M.E.G.
- * M.E.K.
- * I.P.A.
- * DIACETONE
- * S.B. BENZENE
- * BUTYL ACETATE
- * N-BUTANOL
- * SOLVENT CIX
- * D.E.G.
- * M.I.B.K.
- * FORMALDEHYDE

CONTACT:

GOODWILL RASAYAN

296, Samuel Street, 4th Floor, R. No. 48
BOMBAY 400 003.
Tel: Off: 338410; Resi: 5130936

For Your Regular Requirements of:

Acetonitrile
Acetyl chloride
Acrylamide * Acrylonitrile
Allyl Alcohol
Alpha Picoline
Butyl Cellosolve * B.H.T.
Chloroform * Cyclohexane
Di Methyl Formamide
Di Methyl Sulphoxide
Epichloro Hydrine
Ethylene Dichloride
Formic Acid -- 99% & 85%
Hydroxylamine Hydrochloride
Hydroxylamine Sulphate
Iso Amyl Alcohol
Iso Butyl Alcohol
Iso Butyric Acid
Iso Propyl Alcohol
Lithium Hydroxide
Magnesium Oxide
Malonic Acid
Methyl Cellulose 4000
Methyl Cellosolve
Methyl Formate
Morpholine
Methyl Ethyl Ketone
N. Butyl Amine * N. Butyric Acid
N. Heptane * N. Propyl Amine
Quinoline * P.C.B.A.
Para formaldehyde 84-85%
Perchloro Ethylene
Petroleum Ether 40-60%, 60-80%, 60-95%
Secondary Butanol
Sodium Methoxide
Soya Lecithin Powder
Thiourea
Tri-Chloro Ethylene, T.E.G.
Tertiary Butyl Alcohol
Xanthone * Zinc dust

H.P.M.C. 5 CPS, 15CPS, 50CPS, 606 CPS

Please Contact: **Rajendra & Company**

Gopal House, 2nd Floor, 7/9, Kumbharwada Cross Lane, Veer Vithaldas Chandan Street, BOMBAY 400 003.
Phones: 321020/339968/344937 Residence: 6124644/6122149

For Your Requirements Of:

FERRIC CHLORIDE (Anhydrous 98%)
FERRIC CHLORIDE (LUMPS)

Please Contact Manufacturers

NAVJEEVAN-O-CHEM

Regd. Office :
Gawand Building, Khema Lane
Jambli Naka, Thane 400 601
Phone : 503593

Factory
Plot No. 5903-1, GIDC
Ankleshwar 393 002 Dist: Bharuch
Phone : 2938

# Bombay Dyes Market

(Prices as on July 24, 1990)

| ACID COLOURS | Per Kg. |
|---|---|
| Acid Violet 4BS | *190 00 |
| Acid Maroon V | 110 00 |
| Acid Orange II | 112 55 |
| Acid Orange IIY | 93 85 |
| Acid Red A | 137 00 |
| Acid Scarlet 3R | 128 35 |
| Acid Red 3BN | *195 00 |
| Acid Red R2R | 132 00 |
| Acid Red RS | 88 00 |
| Acid Patent Blue AS | *280 00 |
| Acid Green V | *375.00 |
| Acid Coomasi Blue | 200.00 |
| Acid Yellow 5GN | 65.00 |
| Acid Red PG | 85.00 |
| Acid Red GRS | 78.00 |
| Acid Black 10 BX | 157 15 |
| Acid Black BX | 126 95 |
| Acid Black Wax | 135.50 |
| Crosein Scarlet MOO | 200 30 |
| Procinil Yellow GS (ICI, UK) | 265 00 |
| Procinil Red GS (ICI, UK) | 530 00 |
| Procinil Blue RS (ICI, UK) | 315 00 |
| Procinil Scarlet G (ICI, UK) | 600 00 |
| Procinil Orange G (ICI, UK) | 250 00 |
| Procinil Rubine (ICI, UK) | 550 00 |

* To get resale price add 6% tax

| DIRECT COLOURS | Per Kg. |
|---|---|
| Yellow 3GX | 114 00 |
| Gun Yellow RCH | 175 85 |
| Fast Yellow GCH | 171 50 |
| Yellow CFG Hly Conc | 721 00 |
| Fast Yellow GS | 126 96 |
| Fast Yellow CHRS | 116 85 |
| Viscose Orange A | 210 35 |
| Fast Orange GR | 171.50 |
| Red | 122.65 |
| Dark Tan | 98.15 |
| Red IIR | 98.15 |
| Red 4B | 217.55 |
| Bordeaux BW | 170.10 |
| Fast Scarlet 4BS | 223.50 |
| Red 12B | 220.45 |
| Bordeaux Hly. Conc. | 249.20 |
| Cotton Red N | 117.05 |
| Brill. Fast Helio B | 362.85 |
| Brill. Fast Helio 2R | 385 [illegible] |
| Brill Fast Helio 2RS | 177 30 |
| Brill Fast Helio BS | 116 10 |
| Brill Violet Extra | 181.45 |
| Blue 2B | 102 50 |
| Blue G | 220 45 |
| Sky Blue FB | 242 00 |
| Copper Blue GR | 190 25 |
| Fast Greenish Blue GL | 114 60 |
| Developed Black BT | 149 95 |
| Blue NB-2B | 348 45 |
| Blue NB-2BG | 214 70 |
| Developed Black NB-GHB | 214 70 |
| Green B | 142.75 |
| Green NB-B | 218 90 |
| Green 2B-N | 218.90 |
| Brown MR | 197.40 |
| Brown CN | 137.00 |
| Golden Brown G | 175 85 |
| Catechin G | 155 70 |
| Omega Tan | 161.45 |
| Catechin GS | 102 80 |
| Black E Hly Conc | 180 15 |
| Black E Extra Hly Conc | 180 15 |
| Black NB-ER Hly Conc. | 290.50 |
| Red 2B | 422.40 |
| Red FB | 425 80 |
| Red Violet FBL | 622 00 |
| Orange 3R | 254 20 |
| Violet 3R | 370 50 |
| Violet RL | 355 70 |
| Violet 6R | 638 20 |
| Scarlet RR | 283 50 |
| Rubine 3B | 289 10 |
| Rubine CB | 449 50 |
| Blue GL | 419 00 |
| Blue BGF | 805 80 |
| Navy Blue RE | 359 90 |
| Brown 3REL | 272.80 |
| Black GEL | 420.10 |
| Dark Brown 3B | 411.10 |

| DISPERSOL COLOURS | Per Kg. |
|---|---|
| Red B 3B Conc | 611.50 |
| Red B 2B Conc | 797.90 |
| Red CB Powder | 1048 25 |
| Red D2B Powder | 599 85 |
| Violet C 4R Conc | 1202 70 |
| Blue BG Conc | 580 65 |
| Blue BN Powder | 128 20 |
| Blue D 2R Powder | 588 25 |
| Navy BT Conc | 531 95 |
| Blue B 2G Conc | 577 95 |
| Black BT Conc | 319 50 |
| Blue BR | 482.40 |
| Yellow 7GL | 813 20 |
| Yellow 5RX | 269 90 |
| Yellow 3G | 473 20 |
| Yellow | 140 00 |
| Yellow AL | 167 20 |
| Yellow Brown REL | 311.70 |
| Yellow FFL | 571 40 |
| Gold Yellow GG | 320.80 |
| Pink REL | 593 00 |
| Red BEL | 615 60 |

| BASE COLOURS | Per Kg. |
|---|---|
| Fast Yellow GC | 77.75 |
| Fast Orange GC | 128 40 |
| Fast Scarlet R | 198 05 |
| Fast Scarlet RC | 128 40 |
| Fast Scarlet RCR | 105 60 |
| Fast Scarlet G | 115 75 |
| Fast Scarlet GN | 92 95 |
| Fast Scarlet GG | 77 75 |
| Fast Scarlet GGS | 73 95 |
| Fast Red B | 233 50 |
| Fast Red RC | 115.75 |
| Fast Red R Flakes | 158 80 |
| Fast Red TR | 181 60 |
| Fast Red TR Oil | 223 35 |
| Fast Red RL | 251 20 |
| Fast Red KB Oil | 251 20 |
| Fast Bordeaux GP | 236 00 |
| Fast Garnet GBC | 103 05 |
| Fast Violet B | 548 80 |
| Fast Blue BB | 566 50 |

| NAPHTHOL COLOURS | Per Kg. |
|---|---|
| ASG | 301 85 |
| AS | 205 65 |
| ASSW | 379 10 |
| ASBS | 253 75 |
| ASBO | 266 40 |
| ASD | 209 45 |
| ASOL | 243 60 |

| | |
|---|---|
| ASTR | 369.00 |
| ASPH | 336.05 |
| ASE | 236 00 |
| ASEL | .249.95 |
| ASLB | 2002.35 |
| ASBT | 2459.45 |
| ASWG | 143.00 |
| ASSG | 538.65 |
| ASSR | 652.60 |

| PROCION COLOURS | Per Kg. |
|---|---|
| Golden Yellow HR | 207.95 |
| Brill. Yellow H4G | 145.65 |
| Supra Yellow H-8GP | 168.55 |
| Brill. Yellow HE6G | 214.75 |
| Yellow G-E4R | 276.05 |
| Brill. Yellow H7G | 332.30 |
| Yellow M4R | 275.45 |
| Yellow MGR | 387 65 |
| Brill. Yellow M4G | 201.15 |
| Brill. Yellow M8G | 366 10 |
| Yellow M3R | 244.70 |
| Brill Orange H2R | 303 80 |
| Brill. Red H7B | 157.95 |
| Brill. Orange M2R | 313 15 |
| Brill. Red H8B | 213.55 |
| Brill Scarlet H RN | 245.05 |
| Supra Red H-3BP | 179.80 |
| Brill. Red H-F3B | 243.45 |
| Brill. Magenta HB | 182.00 |
| Brill Red M 5B | 160 05 |
| Brill Red M 8B | 218 35 |
| Brill. Pink MB | 137 10 |
| Brill. Magenta MB | 163 65 |
| Brill Purple H-3R | 219.55 |
| Brill. Purple H-7R | 175.40 |
| Navy Blue H 3R | 333 75 |
| Brill Blue H-GR | 406 40 |
| Brill Blue H5G | 207 95 |
| Blue H 5RX | 286 20 |
| Brill Blue H 7G | 213 95 |
| Brill Blue H 7RX | 358 15 |
| Turquoise HA | 265 05 |
| Supra Blue H-3RP | 595 30 |
| Supra Turquoise H 2G P | 181.50 |
| Blue H-FRD | 305.80 |
| Navy Blue H3R | 333.75 |
| Blue H 5RX | 286.20 |
| Navy Blue M3R | 355.70 |
| Brill. Blue MR | 405.60 |
| Brill. Blue M RX | 214.20 |
| Brill. Blue M-G | 226.45 |
| Blue M 4GD | 369.40 |
| Navy Blue M RB | 341.85 |
| Turquoise M-G | 240.30 |
| Brill. Blue M GX | 516.25 |
| Blue 3R Acra Powder | 718.20 |
| Dark Brown H 6R | 248.45 |
| Cobalt Oxide | 285.00 |
| Green H4BD | 287.00 |
| Green H-E4BI | 169.80 |
| Red Brown H IF | 143.25 |
| Orange Brown H 28 | 209.05 |
| Brown M GRN | 188.80 |
| Black H-N | 314.20 |

| SULPHUR COLOURS | Per Kg. |
|---|---|
| Navy Blue | 210.35 |
| Green G | 194.55 |
| Black Grains Extra | 72.25 |
| Black Grains OG | 73.70 |
| Black GXE Conc | 70.85 |
| Black GXE | 57 90 |
| Black GXR | 69.40 |
| Black Grains 800 | 62.80 |
| Black EXR Greins | 73.70 |
| Black EXR Grains 800 | 59 35 |

| VAT COLOURS (ICI) | Per Kg. |
|---|---|
| Yellow 5G Supra Disperse | 561 85 |
| Yellow 5G Acra Conc | 818 60 |
| Gold Orange 3G Pdr Fine | 1158 45 |
| Brill Orange 6R Pdr Fine | 624 35 |
| Gold Orange 3G Supra Disp | 693 85 |
| Brill Orange 6RX Powder | 394 30 |
| Brill Red 3B Pdr Fine | 1214 15 |
| Brill Red 3B Supra Disp | 867 45 |
| Brill: Purple 3R Acra Powder | 827 05 |
| Brill. Purple 2R Hly Conc. | 744.25 |
| Brill. Purple 4R Supra Disp. | 604.25 |
| Brill. Purple 2R Acra Conc. | 779.85 |
| Blue 2R Powder Fine | 675.30 |
| Blue BC Acra Con Pdr. Fine | 1013.15 |
| Blue BC Conc. Pdr. Fine | 713.65 |
| Blue R Conc. Pdr. Fine | 719.70 |
| Blue Conc. Powder | 645.80 |
| Brill. Blue 2R Hly. Conc. | 378.55 |
| Blue RR Supra Powder | 629.35 |
| Brill. Blue 2R Supra Disp. | 115.65 |
| Dark Blue 2R Powder Fine | 512.65 |
| Blue BC Supra Disp. | 419.65 |
| Jade Green XBN Powder Fine | 555.80 |
| Jade Green XBN Acra Conc. Pdr | 1026.05 |
| Jade Green 2G Pdr. Fine | 533.25 |
| Jade Green 2G Ptg. Paste | 125.40 |
| Jade Green XBN Ptg. Paste | 126.00 |
| Jade Green 2G Supra Disp. | 618.00 |
| Olive D Pdr. Fine | 563.90 |
| Olive Green B Supra Disp. | 421.70 |
| Jade Green XBN Supra Disp. (N) | 327.30 |
| Olive OMW Powder Fine | 698.55 |
| Olive OMW Supra Disp. | 538.05 |
| Olive D Supra Disp. | 361.70 |
| Olive R Supra Disp. | 470.25 |
| Olive D. Ptg. Paste | 193.00 |
| Olive Green B Ptg. Paste | 199 10 |
| Olive Green B Acra Conc. | 741 10 |
| Olive R Acra Conc.. | 779 85 |
| Brown R Pdr. Fine | 869 45 |
| Dark Brown 3R Fine | 826 25 |
| Brown G Supra Disp | 582 05 |
| Brown 2G Supra Disp. | 716 10 |
| Brown R Supra Disp | 547 35 |
| Brown BR Powder | 867 75 |
| Dark Brown 3R Ptg. Paste | 217 15 |
| Dark Brown 3R Supra Disp | 529 60 |
| Brown G Acra Conc. | 967 95 |
| Brown M Powder Fine | 768 80 |
| Grey M. Supra Disp. | 585.45 |
| Blue BC Acra Conc Pdr. Fine | 762 70 |
| Direct Black AC Supra Disp. | 415 75 |
| Direct Black AC Pdr Fine | 574 70 |
| Direct Black CH Supra Disp | .190 45 |
| Direct ACD Ptg. Paste | .217.15 |

# Delhi Market

**DELHI: JULY 20, (NNS)** Sufolite advanced by Rs. 3.50 at Rs. 56.50 per kg in the Delhi chemicals market during the week under review, on account of brisk buying by stockists in anticipation of hike in its prices by the manufacturers, reports NNS. Chatkolite flared up by Rs. 7 at Rs. 54.50 in the absence of fresh import from China and higher advices from Bombay. Rangolite Germany also remained firm at Rs. 82 per kg.

Sodium hydrosulphite Damosha and Kalali moved up by 50 paise at Rs. 39 and Rs. 40/kg respectively due to shortage of stock combined with sustained support from consumers. Gulshan hydro remained static at Rs. 37.50 against Rs. 37/kg owing to good offtake camphor powder and thal advanced sharply by Rs. 3 each at Rs. 106/kg respectively because of increased demand for forthcoming festivals as well as dwindling stock in the market.

Sodium sulphate registered a marked rise of Rs. 200 at Rs. 3,600/3,900 per tonne on rumours of sharp revision in its prices by the manufacturers. In the absence of fresh supply, boric acid technical went up by Rs. 25 at Rs. 1,650 per 50 kg. Sodium nitrite quoted higher by Rs. 50 at Rs. 1,050/1,150 owing to rise in demand from consumers at lower level. As a result of paucity of supply and keen buying interest from bakeries and halwaies, ammonia bicarb went up sharply by Rs. 20 at Rs. 170 per 25 kg.

On account of persistent offerings from Sambhal, Moradabad, Chandausi and Rampur areas of U.P. combined with negligible demand from pan masala manufacturers, menthol medium and bold slipped by Rs. 10/15 at Rs. 340 and Rs. 375 per kg respectively. Menthol flake drifted lower by Rs. 10 at Rs. 285. Mentha oil eased by Rs. 5 at Rs. 195, while DMO rose from Rs. 80 to Rs. 87 owing to reduced supply. Citric acid Chinese tumbled down by Rs. 25 at Rs. 1,875 thanks to better offerings. After declining from Rs. 540 to Rs. 525 in the early part of the week because of persistent offerings, but later, owing to increased stocking monopoly amongst the manufacturers, its prices improved slightly and closed at Rs. 535. No change was seen in the prices of dyes and colours.

## (DELHI MARKET RATES AS ON JULY 20, 1990)

| | |
|---|---|
| Ammonia Bicarb (Per 25 Kg.) | 170.00 |
| Mercury (Per flask) | 11,000.00 |
| Soda ash (Per bag) | 360/380.00 |
| Ammonium Chloride (50 Kg.) | 120/180.00 |
| Caustic soda flakes (50 Kg.) | 535 00 |
| Citric acid (Per 50 Kg.) | 1,875/2,375.00 |
| Stable Bleaching Powder Shriram (Per 25 Kg.) | 101.00 |
| Stable Bleaching Powder KCl (Per 25 Kg.) | 90.00 |
| Stable Bleaching Powder Maruti (Per 25 Kg.) | 91.00 |
| Stable Bleaching Powder Modi (Per 25 Kg.) | 92.00 |
| Sodium Bicarbonate (50 Kg.) | 315/325.00 |
| Sodium Hydrosulphite (Per Kg.) | 37.50/40.00 |
| Rangolite (Per Kg.) | 82.00 |
| Tartaric acid France (Per Kg.) | 280.00 |
| Sufolite (Per Kg.) | 56.50 |
| Chatkolite (Per Kg.) | 54.50 |
| DMO (per Kg.) | 80.00 |
| Boric acid Technical (Per 50 Kg.) | 1,625.00 |
| Paraffin Wax (Per 50 Kg.) | 980.00 |
| Slack wax (Per metric tonne) | 10,400.00 |
| Tartaric Acid (Swastik Per Kg.) | N.A. |
| Borax Granular (Per 50 Kg.) | 800.00 |
| Borax Crystal (Per 50 Kg.) | 825.00 |
| Sodium Nitrite (Per 50 Kg.) | 1,050/1,150.00 |
| Sodium Nitrate (Per 50 Kg.) | 500.00 |
| Camphor Thal (Per Kg.) | 106.00 |
| Camphor Powder (Per Kg.) | 96.00 |
| Menthol Bold (Per Kg.) | 375 00 |
| Menthol Medium (Per Kg.) | 340.00 |
| Menthol Flake (Per Kg.) | 285.00 |
| Mentha Oil (Per Kg.) | 200.00 |
| Glycerine (Per Kg.) | 55/58.00 |
| Sodium Silicate (Per quintal) | 300/400.00 |
| Hexamine (Per Kg.) | 34.00 |
| Acetic Acid Glacial (Per Kg.) | 13.75 |
| Copper Sulphate (Per quintal) | 2,300/2,600 |
| Formic Acid (Per Kg.) | 24.00 |
| Formaldehyde (Per Kg.) | 8.50 |
| Hydrogen Peroxide (Per Kg.) | 33.00 |
| Calcium Carbonate (Per Tonne) | 5,800 |
| Acid Slurry Soft (Per Kg.) | 27.00 |
| Acid Slurry Hard (Per Kg.) | 32.00 |
| Phosphoric Acid (Per 50 Kg.) | 1,235.00 |
| Potassium Nitrate (Per quintal) | 1,000/1,250.00 |
| Potassium Permanganate (Per 50 Kg.) | 2,600/3,000.00 |
| Sodium Bichromate (Per 50 Kg.) | 1,575/1,600.00 |
| Trisodium Phosphate (50 Kg.) | 570.00 |
| Titanium Dioxide Anatase T.T.P. (Per Kg.) | 63 00 |
| Titanium Dioxide RC-822 (Per Kg.) | 86.00 |
| Titanium Dioxide Anatase K-Brand (Per Kg.) | 60 00 |
| Titanium Dioxide RCR-2 (Per Kg.) | N.A. |
| Zinc Oxide (Per Kg.) | 46.00/50.00 |
| Phenol Carbolic Acid (Per Kg.) | 39.00 |
| Carbon Tetrachloride (Per Kg.) | 24.75 |
| Chloroform (Per Kg.) | 28.00 |
| Sodium Sulphate (Per metric tonne) | 3,400/3,900.00 |
| Naphthalene Balls (Per 50 Kg.) | 1,375.00 |

| DYES & COLOURS | (Per Kg.) |
|---|---|
| Naphthol AS | 175/211.50 |
| Naphthol ASG | 180/249.70 |
| Naphthol ASBS | 210/260.75 |
| Naphthol ASTR | 300/378.92 |
| Naphthol ASOL | 210/250.90 |
| Naphthol ASBO | 195/274.30 |

| DIRECT DYES | (Per Kg.) |
|---|---|
| Black E. Conc. | 120/185.30 |
| Diazo Black B.T. | 105/154.50 |
| Green B | 90/147.55 |
| Blue 2-B | 60/107.00 |
| Blue 2-B 225% (JNR) | 125.00 |
| Sky Blue FB | 160/248.20 |
| Basic Auramine | 55/110.00 |
| Basic Rhodamine | 300/425.00 |
| Basic Methylene Blue | 100/180.00 |
| Basic Violet | 165/210.00 |
| Basic Malachite Green | 175.00 |
| Acid Orange | 75/111.20 |
| Congo Red H/C | 75/120.95 |

# Madras Market

Markets were dull except for few ems. There was spurt in demand r sodium sulphide flakes and the ices shot up to Rs. 20/kg. Sodium trite prices came down slightly but still in demand. Acetone prices improved on reports of export commitment of the material by manufacturers. Titanium dioxide prices came to par with practically no takers.

## (MADRAS MARKET RATES AS ON JULY 21, 1990)

| | |
|---|---|
| cetic Acid Glacial (per kg) | 14.00 |
| uminium Sulphate Iron free (per MT) | 3,750.00 |
| mmonium Bicarbonate (per 25 kgs) | 150.00 |
| mmonium Chloride (per MT) | 2,500.00 |
| cid Slurry (per kg) | 31.50 |
| arium Carbonate (per kg) | 11.00 |
| arium Chloride (per kg) | 10.50 |
| oric Acid Technical (per kg) | 26.00 |
| leaching Powder (per 50 kgs) | 220.00 |
| orax (per 50 kgs) | 785.00 |
| austic Soda Flakes -- Mettur Chemicals (per MT) | 11,500.00 |
| austic Soda Flakes -- Andhra Sugars (per MT) | 11,500.00 |
| alcium Chloride 70% Solid (per MT) | 3,500.00 |
| alcium Chloride Anhydrous (per MT) | 6,500.00 |
| alcium Carbonate (Activated) (per MT) | 6,500.00 |
| Calcium Carbonate (Precipitated) (per MT) | 5,500 00 |
| Citric Acid (per kg) | 48.00 |
| Copper Sulphate (per kg) | 24.00 |
| Cresylic Acid 98-99% (per kg) | 130.00 |
| Pure Para Cresol 96% (per kg) | 85.00 |
| Meta Para Cresol 42% (per kg) | 50.00 |
| Formic Acid (per kg) | 27.00 |
| Formaldehyde (per kg) | 8.00 |
| Glue Flakes (per kg) | 15.00 |
| Glycerine I.W. (per kg) | 49.00 |
| Hydrosulphite of Soda (TCPL) (per kg) | 38.00 |
| Hydrosulphite of Soda (IDI) (per kg) | 42.00 |
| Hydrosulphite of Soda (BASF) (per kg) | 41.00 |
| Hexamine (per kg) | 31.00 |
| Hyflosupercell (per kg) | 21.00 |
| Hydrogen Peroxide (per kg) | 32.00 |
| Litharge (per kg) | 38.00 |
| Lead Acetate (per kg) | 38.00 |
| Magnesium Carbonate (per kg) | 18.00 |
| Magnesium Chloride (per kg) | 4.00 |
| Maleic Anhydride (per kg) | 40.00 |
| Menthol Crystals (per kg) | 320.00 |
| Oxalic Acid (per kg) | 19.00 |
| Paraffin Wax (per kg) | 17.50 |
| Potassium Bichromate (per kg) | 36 00 |
| Phosphoric Acid (per kg) | 27.50 |
| Polyvinyl Alcohol Powder (per kg) | 150 00 |
| Pentaerythritol (per kg) | 52.00 |
| Phthalic Anhydride (per kg) | 30.00 |
| Soda Ash (TAC) (per 75 kgs) | 410.00 |
| Soda Ash (TATA) (per 75 kgs) | 410.00 |
| Sodium Bicarbonate (TATA) (per 50 kgs) | 390.00 |
| Sodium Silicate (per MT) | 3,500.00 |
| Sodium Bichromate (per kg) | 26.00 |
| Sodium Nitrate (per kg) | 8 00 |
| Sodium Nitrite (per kg) | 28.00 |
| Sodium Sulphide Flakes (per kg) | 14.00 |
| Sodium Bisulphite (per kg) | 9.00 |
| Sodium Alginate (per kg) | 290 00 |
| Sodium Acetate (per kg) | 7 00 |
| Sodium Sulphate (Anhydrous) (per kg) | 4.00 |
| Titanium Dioxide (Anatase) (per kg) | 62.50 |
| Titanium Dioxide (Rutile) (per kg) | 85.00 |
| Trisodium Phosphate (per kg) | 10 00 |
| Urea (Technical) (per kg) | 3.00 |
| Zinc Oxide (per kg) | 54 00 |
| Zinc Chloride Powder (per kg) | 14 00 |
| Zinc Sulphate (per kg) | 8 00 |

### SOLVENTS

| | |
|---|---|
| Acetone -- HOCL (per kg) | 19 00 |
| Butanol (per kg) | 35 00 |
| Butyl Acetate (per kg) | 40 00 |
| Benzene (per lit) | 14 00 |
| Cellosolve (per kg) | 60 00 |
| Carbon Tetra Chloride (per kg) | 22 00 |
| Chloroform (per kg) | 29 00 |
| Diacetone Alcohol (per kg) | 30 00 |
| Diethylene Glycol (per kg) | 32 00 |
| Dichloroethane (per kg) | 17 00 |
| Di-octyl Phthalate (per kg) | 46 00 |
| Di-N-butyl Phthalate (per kg) | 46 00 |
| Ethyl Acetate (per kg) | 16 00 |
| Isopropyl Alcohol (per kg) | 29 00 |
| Methanol (per kg) | 10 00 |
| Methylene Chloride (per kg) | 22 00 |
| Methyl Ethyl Ketone (per kg) | 30 00 |
| Methyl Isobutyl Ketone (per kg) | 41 25 |
| Phenol (per kg) | 38 00 |
| Sorbitol (per kg) | 15 00 |
| Triethanolamine (per kg) | 95 00 |
| Trichloroethylene (per kg) | 26 00 |
| 1-1-1 Trichloroethane (per kg) | 29 00 |
| Turpentine (per lit) | 16 00 |
| Toluene (per lit) | 14 00 |
| Xylene (per lit) | 25 00 |

# Shipping News

## VESSELS DUE IN BOMBAY FOR EXPORT LOADING

| Due Date (1) | Steamer's Name & Flag (2) | Agents (3) | Will load for (4) | Approx sailing d (5) |
|---|---|---|---|---|
| 28/7 | A. Ognivtsev (VIA No. 900070) | Transocean | Odessa; Illyichevsk, Havana; (Cuba); Genova; Trieste, Piraeus, Marseilles, Barcelona, Varna, Bourgas. (Carting at Kalamboli) | 31/7 |
| 28/7 | Ville De Colombo (Ger)(Voy-2218) | C.M.A. | Alexandria; Marseilles; Istanbul; Lisbon; Barcelona; Le Havre; Hamburg; Felixstowe; Thames Port (London); Rotterdam; Antwerp; Limassol; Lattakia; Tunis; Copenhagen; Aarhus; Gothenburg; Stockholm; Helsinki; Belfast. (Carting at E-Grain Depot). | 1/8 |
| 30/7 | Menkar (Cyp) | P&O | Assab; Djibouti; P. Sudan. (Carting at Timber Pond No. 4). | 4/8 |
| 30/7 | Green Valley | M.S.P.L. | Assab; P. Suez; (Alexandria). (Carting at P/Q-PD). | 31/7 |
| 30/7 | Anika Oltmann | Samrat/ Hindustan/ | Felixstowe; Hamburg; Rotterdam; Also London; Liverpool; Leixoes; Lisbon; Manchester; Avonmouth; Wembly; Birmingham; Leicester; Le Havre; Bremen; Amsterdam; Antwerp; Copenhagen; Leeds; Aarhus; Gothenburg; Oslo; Helsinki; Stockholm; Belfast & all destinations in U.K., Benelux, Germany; Italy; France; Switzerland; & Austria. (Carting at M.O.D. No. 2 and B. Pier Extn. for Samrat & Hindustan). | 5/8 |
| | | Killick | Felixstowe; London; Liverpool; Manchester; Bristol; Avonmouth; Leeds; Glasgow; Tilbury; Birmingham; Dublin; Belfast; Rotterdam; Hamburg; Le Havre; Antwerp; Bremen; Bremerhaven. (Carting at E-Shed G.D.). | |
| Stream | S/o. Nagaland | S.C.I. | Chittagong. (Carting at Timber Pond No. 1). | 317 |
| 28/7 | A. Ognivtsev (Nhava Sheva) | Transocean | Afghanistan (Carting at Kalamboli) | 31/7 |
| Stream | S/o. Nagaland | S.C.I. | Penang; Singapore; Hualien; Main Japan ports; (Busan). (Carting at T.P. No. 1). | 31/7 |
| 23/7 | Ocean Sincerity (Lib) (V-25A/B) | O.S.A./ | P. Kelang; Singapore; Kaohsiung; Hongkong; Bangkok; Kobe; Yokohama; Nagoya; Moji; Osaka; Busan; Tokyo; Simizu; Keelung; Tsingtao; Quindao; Ziangang; Shanghai. (Carting at M-178/180 C.D.). | 31/7 |
| | | M.S.P.L. | Singapore; Bangkok; P. Kelang; Keelang; Jakarta; Manila. (Carting at Grain Depot). | |
| 2/8 | Supanya (Thai) (Voy-37) | U.L.A./ | Singapore; Penang; P. Kelang; Keelung; Kaohsiung; Bangkok; Busan; Jakarta; Hongkong; Japan and Chinese ports. (Carting at M-171/173 Cotton Depot). | 6/8 |
| | | Samrat/ | Singapore (Direct); Penang; Jakarta; Surabaya; Belawan; P. Kelang; Bangkok; Manila; Hongkong; Kaohsiung; Keelung; Taichung; Busan; Yokohama; Nagoya; Kobe; Osaka; Tokyo. (Carting at Mallet Bunder). | |
| | | Trident/ | Busan; Hongkong; Keelung; Kobe; Nagoya; Yokohama; Penang; P. Kelang; Bangkok; Kaohsiung; Singapore. (Carting at T.P. No. 4). | |
| | | E.S.P.L. | Singapore; Hongkong; Bangkok; Jakarta; Kaohsiung; Keelung; Penang; P. Kelang; Kota; Kinabulu; Kulaubelati; Bintulu; Kuching; Lauban; Vietnam. (Carting at M-172 Cotton Depot). | |
| | | I.M.E./ | Singapore; Bangkok; Hongkong; Keelung; Busan; Kobe; Yokohama; Nagoya. (Carting at Wadi Bunder No. 3). | |
| | | P&O/ | Far East & S. East Asian Ports. (Carting at Timber Pond No. 4). | |
| | | Sarada | Bangkok; Hongkong; Chinese Ports. (Carting at M-172 Cotton Depot). | |
| 30/7 | Mahsuri | I.M.E./Killick P&O | Singapore. (Carting at H.B. No. 5 for Killick). (Carting at T.P. No. 4 for P&O, Carting at W.B. No. 3 for I.M.E.). | 4/8 |
| 30/7 | Green Valley | M.S.P.L. | Singapore. (Carting at P/Q-PD) | 31/7 |
| 23/7 | Ocean Sincerity | O.S.A. | Sydney; Melbourne; Adelaide; Brisbane; Fremantle; Auckland; Wellington; Lyttelton; P. Chalmers. (Carting at M-178/180 Cotton Depot) | 31/7 |
| 2/8 | Supanya | Samrat/ | Brisbane; Sydney; Melbourne; Adelaide; Fremantle; Burnie. (Carting at Mallet Bunder). | 6/8 |
| | | Trident/ | Brisbane; Sydney; Melbourne; Adelaide; Fremantle; Burnie; Auckland; Wellington; Lyttleton. (Carting at T.P. No. 4). | |
| | | Arebee/ | Sydney; Melbourne; Adelaide; Brisbane. (Carting at M-Jetha C.D.). | |
| | | Transworld/ | Sydney; Melbourne; Adelaide; Fremantle; Burnie; Brisbane. (Carting at CFS Cotton Avenue). | |
| | | E S P.L. | Sydney; Melbourne; Adelaide; Fremantle. (Carting at M-172 C. D.). | |

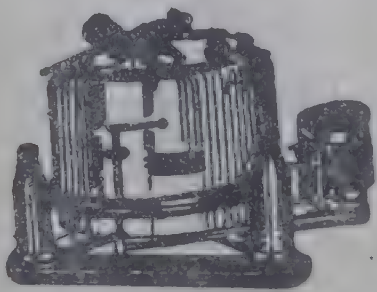
| ) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| 0/7 | Mahsuri (Voy-0578) | Killick/ P&O/ | Melbourne; Sydney; Brisbane; Adelaide; Fremantle; P. Hobart; Devon P. Launceston; Burnie; P. Chalmers; Lyttelton; Christchurch; Dunedin; New Plymouth, Auckland; Wellington; Napier also Western Samoa; Papua; New Guinea; Solomon Island; American Samoa; Tonga; New Caledonia; Rabaul; P. Villa. (Carting at H.B. No. 5 for Killick) (Carting at T.P. No. 4 for P&O). | 4/8 |
| | | I.M.E. | Sydney; Melbourne; Adelaide; Fremantle; Brisbane; Auckland; Wellington; Lyttelton. (Carting at W.B. No. 3). | |
| 3/7 | Ville De Colombo | C.M.A. | Dubai; Mina Qaboos; Abu Dhabi; Bahrain; Doha; Dammam; Riyadh; Kuwait; Iraq. (Carting at E-Shed Grain Depot). | 1/8 |
| 1/7 | Rossana (Ind) | Mackintosh | Muscat; Dubai. (Carting at C-PD). | 31/7 |
| 2/7 | Global Exp. No.5 | Sai Ship | Dubai. (Carting at E-Shed Grain Depot). | 31/7 |
| 3/7 | Lanka Mahapola (Sri L.)(V-95) | Seahorse | Dubai; Sharjah; Muscat; Dammam; Riyadh; Kuwait; Salallah; Doha; Abu Dhabi; Bahrain. (Carting at M.O.D. No. 3). | 1/8 |
| /8 | Supanya | Seahorse | Port Louis. (Carting at M.O.D. No. 3). | 6/8 |
| 2/7 | Global Express No. 5 | Sai Ship | Mogadisio; Mombasa; Dar Es Salaam; Beira; Maputo. (Carting at E-Grain Depot). | 31/7 |
| 0/7 | Menkar (V-06) (Cyp) | Arebee/ | Dar Es Salaam & Mombasa (Direct); Kampala; Jinja; Toronto; Lugazi Entebee (Uganda); Kigali (Rwanda); Kitwe; Lusaka; Ndola (Zambia); Lilongwe, Blantyre (Malawi); Maputo; Zanzibar. (Carting at M.J.C.D.) | 1/8 |
| | | P&O | Mombasa; Dar Es Salaam (Direct); Beira; Mahe and inland destinations in East Africa. (Carting at Timber Pond No. 4). | |
| 3/7 | Ocean Sincerity (V-25A/B) | O.S.A. | New York; Baltimore; Philadelphia; Houston; Boston; Chicago; Dallas; Atlanta; Savannah; Norfolk; Charleston; Los Angeles; San Francisco; Oakland; Seattle; Vancouver; Toronto; Montreal; Portland; Tacoma & S. American & W. Indies Ports. (Carting at M-178/180 Cotton Depot). | 31/7 |
| 0/7 | Mahsuri | Killick | S. American Ports. (Carting at Hay Bunder No. 5). | 4/8 |
| 0/7 | Green Valley (Ame) | M.S.P.L. | Philadelphia; Baltimore; Norfolk; New Orleans; Houston; Savannah; New York. (Carting at P/Q-PD). | 31/7 |
| /8 | Hoegh Clipper | Patvolk | Montreal & Toronto via Halifax; New York; Boston; Norfolk; Charleston; Houston; Savannah; Wilmington; Philadelphia; Baltimore; New Orleans; & FCL Chicago; Milwaukee; Atlanta; Dallas. (Carting at H.B. No. 5). | 9/8 |
| /8 | Supanya (Voy-37) (Thai) | Samrat/ | Longbeach; Oakland; Seattle; Los Angeles; San Francisco, Philadelphia; Savannah; Charleston; Baltimore; Norfolk; New York; Boston; St. John; Vancouver; Montreal; Toronto; New Orleans; Houston. (Carting at M.B.). | 6/8 |
| | | U.L.A./ | Los Angeles; San Francisco; Oakland; Seattle; Vancouver; Charleston; Houston; Norfolk; Baltimore; New York; Halifax; Montreal; Toronto; Houston; West Indies Ports. (Carting at M-171/173 Cotton Depot). | |
| | | E.S.P.L./ | Longbeach; Charleston; New York; St. John; Norfolk; Oakland; Vancouver (B.C.); Seattle; Montreal; Baltimore; Boston; Chicago; Dallas; Houston; Longview; Los Angeles; New Orleans; Philadelphia; Portland; San Diego; Mexico City; San Francisco; Siouxfall; Sacramento, Stockton; Halifax; Toronto; Savannah; Tacoma; Miami and all other destinations. Also Caribbean ports. (Carting at M-172 Cotton Depot). | |
| | | Trident | S. American; Caribbean & Central American Ports. (Crtg. at T.P. No.4) | |
| | | Arebee | S. American ports (Carting at M-Jetha Cotton Depot). | |
| 0/7 | Menkar (Voy-06) | Arebee | Lagos/Apapa; P. Harcourt; Abidjan; Tema; Takoradi; Monrovia; Lome; Freetown; Cotonou; Douala; Matadi. (Carting at M-Jetha C.D.). | 4/8 |
| 2/8 | Supanya | U.L.A./ | Lagos/Apapa; Abidjan; Lome/Matadi. (Carting at M-171/173 C.D.). | 6/8 |
| | | Trident | Tema/Lome; Lagos; Matadi; Lobito; Luanda; Freetown; Cotonou; Douala; P. Harcourt; Abidjan; Monrovia; Dakar. (Crtg at T.P. No. 4). | |

## VESSELS DUE FOR IMPORT DISCHARGE

| Due Date | Steamer's Name | Agents | From |
|---|---|---|---|
| 1/8 | Hoegh Clipper | Patvolk | U.S.A. |
| 2/8 | Supanya (V-37) | Samrat/ESPL/IME | U.S.A. |
| 7/8 | Vanil | S.C.I. | Japan/Far East |
| 4/8 | Z. Solovyev | Transocean | Far East |

**CENTRIFUGES (Hydro-Extractor)**

**30 cm to 150 cm dia basket size in MS/SS/SS Lined/RL/RRP Lined**



**We also Fabricate**
**REACTION VESSELS, PRESSURE VESSELS, CONDENSORS, STORAGE TANKS, BALL MILLS & MS/SS FABRICATION.**

**CONTACT MANUFACTURERS:**

**CHEMO FAB INDUSTRIES**

Ram Baug, Behind State Bank of India, S.V. Road,
Chincholi, Malad (West), Bombay-400 064.
**Phones: Factory. 6821401/6821695 Resi.: 6821694**

**Agent for Andhra Pradesh -- Mr. M.N. Rao, M/s. Anirudh Agencies,**
B-104, Badruka Enclave, Road No. 12, Banjara Hills, Hyderabad-500 034.

---

FOR TICKETS BY LUXURY BUS

**IDEAL TRAVELS**

BANGALORE - MANGALORE - MYSORE - KERALA

CONTACT:

**PATEL TRAVEL AGENCIES**

SWAGAT CO-OP. HOUSING SOCIETY,
BUILDING 3/A, BLOCK NO. 1,
"DAMODAR PARK",
L.B.S. MARG, GHATKOPAR,
BOMBAY - 400 086.
PHONE: 581958/587264
CABLE: FLODYES
TELEX: 011-75806 FLOR-IN

---

**For your Import Requirement of**

**AMMONIUM THIOCYANATE 93%**
**NONYL PHENOL ETHOXYLATED**
**ZEOLITES & OTHER HYDROCARBON PURIFICATION CHEMICALS**

**Available best quality material at most competitive prices in INDIAN RUPEES from EAST EUROPE**

Importers/Actual Users/Indenting Agents please send your enquiries to

**BOX NO. 1257**

**CHEMICAL WEEKLY**
306, Shri Hanuman Industrial Estate,
G.D. Ambekar Road, Wadala, Bombay 400 031.

# Materials Imported

## MATERIALS IMPORTED BOMBAY (From 20.4.90 to 28.4.90)

ISO BUTYL BENZENE: From China: Kekule Chemicals Pvt. Ltd., 1,020 Kgs., Rs. 47,346.

ISODECYL DIPHENYL PHOSPHATE: From UK: Moti Electric Inds., Ltd., 5.06 Mts., Rs. 2,47,629.

ITACONIC ACID: From Japan: Indofil Chemicals Co., 3,000 Kgs., Rs. 1,48,983.

LINALOOL: From FRG: The Tata Oil Mills Co. Ltd., 4,080 Kgs., Rs. 6,13,628.

MERCAPTOBENZIMIDAZOLE: From Japan: Nirlon Ltd., 4,500 Kgs., Rs.10,06,645.

2 MERCAPTOBENZIMIDAZOLE: From Japan: Supreme India Intl., 4,800 Kgs., Rs. 11,11,336.

META CRESOL 98% MIN: From Japan: Hickson & Dadajee Ltd., 16,000 Kgs., Rs. 6,70,134.

META XYLIDINE ORTHO SULPHONIC ACID: From Japan: Formokem India Corpn., 1,000 Kgs., Rs. 17,113.

METHYL CHLOROFORMATE: From USA: Cipla Limited, 7,593 Kgs., Rs. 1,60,336.

METHACRYLIC ACID, GLACIAL: From Japan: Indofil Chemicals Co., 16,000 Kgs., Rs. 5,69,614.

METHYL POTASSIUM: From Italy: Armour Chemicals Ltd., 2,000 Kgs., Rs. 7,41,684.

MONO METHYL ACETO ACETAMIDE: From FRG: Sudershan Chemical Inds. Ltd., 4,788 Kgs., Rs. 13,36,817.

MORPHOLINE: From Saudi Arabia: Bayer India Ltd., 30,112 Kgs., Rs. 10,40,483.

N-DODECYL MERCAPTAN: From China: P.K. Enterprises, 100 Kgs., Rs. 20,129.

NAPHTHALENE CRUDE: From Cuba: Fibro India, 120 Mts., Rs. 8,90,022.

4-NITRO 2-AMINOPHENOL: From Japan: BASF India Ltd., 400 Kgs., Rs. 69,806.

PARACUMIDINE: From Japan: Hoechst India Ltd., 15,200 Kgs., Rs. 10,71,920.

PARAFORMALDEHYDE 91%: From Spain: Ion Exchange India Ltd., 18 Mts., Rs. 1,54,788.

PARA TERTIARY BUTYL CYCLO HEXANOL: From USA: Hindustan Lever Ltd., 10,880 Kgs., Rs. 6,87,588.

PATCHOULI OIL: From Indonesia: S.M. Kelkar & Co. Ltd., 2,600 Kgs., Rs. 7,45,275.

POLYETHER POLYOL: From Belgium: Tirupati Foams Pvt. Ltd., 12,47 Kgs., Rs. 2,36,117.

POLYETHYLENE: From Canada The Bharat Vijay Mills Ltd., 26,25 Kgs., Rs. 4,37,485.

POLYETHYLENE GLYCOL: From Japan: Khandelwal Labs. Ltd., 1,15 Kgs., Rs. 43,495.

POLYVINYL PYRIDINE: From FRG: Burroughs Wellcome (India) Ltd., 750 Kgs., Rs. 1,82,989.

PIVALOYL CHLORIDE: From USA: Kopran Chemical Co. Ltd., 7,20 Kgs., Rs. 5,11,467.

PROPIONIC ACID: From Saudi Arabia : Indian Organic Corpn., 72,000 Kgs., Rs. 8,92,116.

PROPYLENE GLYCOL: From FRG: Goodlas Nerolac Paints Ltd., 5,160 Kgs., Rs. 1,20,651; From USA: Pfizer Limited, 16,770 Kgs., Rs. 3,07,293.

PROPYLENE GLYCOL TECH:

AVAILABLE

*** Synthetic Khadi**

*** Cotton Khadi**

Contact Manufacturers:

**NEOPRINT COLOUR & CHEMICALS**

101, Matru Chhaya, 378/380, Narsi Natha Street,
BOMBAY 400 009.

**Phone: 348727, 336561**

From Japan: Hi-Tech Polymer, Kgs., N.A., Rs. 1,77,743; Hi-tech Industries, 5.67 Mts., Rs. 95,981.

SELENIUM METAL: From Japan: Sudershan Chemical Inds., 300 Kgs., Rs. 70,155.

SILICON METAL: From China : Galada Continuous Castings Ltd., 5 Mts., Rs. 87,257.

SILICON METAL LUMPS: From Cuba: Fibro India, 17,600 Kgs., Rs. 3,83,931.

SODIUM 2-ETHYL HEXANOATE: From Italy: Gujarat Lyka Organics Ltd., 4,020 Kgs., Rs. 2,57,733.

SODIUM LAURYL ETHER SULPHATE: From FRG: Hindustan Lever Ltd., 36,920 Kgs., Rs. 9,35,822.

SODIUM PICRAMATE: From France: BASF India Ltd., 2995.50 Kgs., Rs. 5,76,662.

SODIUM STARCH GLYCOLATE: From Netherlands: Blue Cross Laboratories Ltd., 250 Kgs., Rs. 28,896.

STYRENE MONOMER : From Netherlands: Parikh Chemical Inds., 8.800 Mts., Rs. 1,76,609.

STYRENE COPOLYMER: From Brazil: Modi Xerox Ltd., 6 Mts., Rs. 3,09,446.

SYNTHETIC RESIN: From France: Bhavnani & Sons Private Limited, 5.400 Mts., Rs. 1,29,577; From USA: Shree Shubh Industries, 1,365.32 Kgs., Rs. 42,394.

PARA TOLUIDINE META SULPHURIC ACID: From Korea : Pidilite Industries Limited, 2,000 Kgs., Rs. 1,28,339.

TITANIUM DIOXIDE: From Australia: Asian Paints India Ltd., 10 Mts., Rs. 46,24,620; From China: P.K. Enterprises, 17,500 Kgs., Rs. 4,12,289; Sampada Enterprises, 17,500 Kgs., Rs. 3,91,250; From Japan: Goodlass Nerolac Paints Ltd., 17.5 Mts., Rs. 8,39,848; From USA: Asian Paints India Ltd., 60,000 Kgs., Rs. 36,61,595; Hind Polymers, 18.150 Mts., Rs. 8,47,287.

TITANIUM DIOXIDE 97% Min: From China: Fibro India, 17.500 Mts., Rs. 4,12,289.

TITANIUM DIOXIDE ANATASE: From UK: Lakhani Rubber Udyog Ltd., 250 Mts., Rs. 8,48,138.

TITANIUM DIOXIDE RUTILE: From UK: Asian Paints India Ltd., 1,00,000 Kgs., Rs. 47,20,605.

TITANIUM TETRACHLORIDE: From France: Super Urecoat Inds. Pvt. Ltd., 9.920 Mts., Rs. 2,54,370.

TRIETHYLENE GLYCOL: From Cuba: Fibro India, 4,050 Kgs., Rs. 89,337.

TRIMETHYLOL PROPANE: From Sweden: Resins and Plastics Ltd., 3,000 Kgs., Rs. 86,384.

3,4,5 TRIMETHOXY BENZALDEHYDE 99%: From China Shala Chemicals Pvt. Ltd., 500 Kgs., Rs. 1,75,400.

3,4,5 TRIMETHOXY BENZALDEHYDE: From China: Shaba Chemicals Pvt. Ltd., 1,000 Kgs., Rs. 3,45,633.

CHLORINATED XYLENOLS: From UK: Sodium Metal Pvt. Ltd., 3,000 Kgs., Rs. 1,25,977.

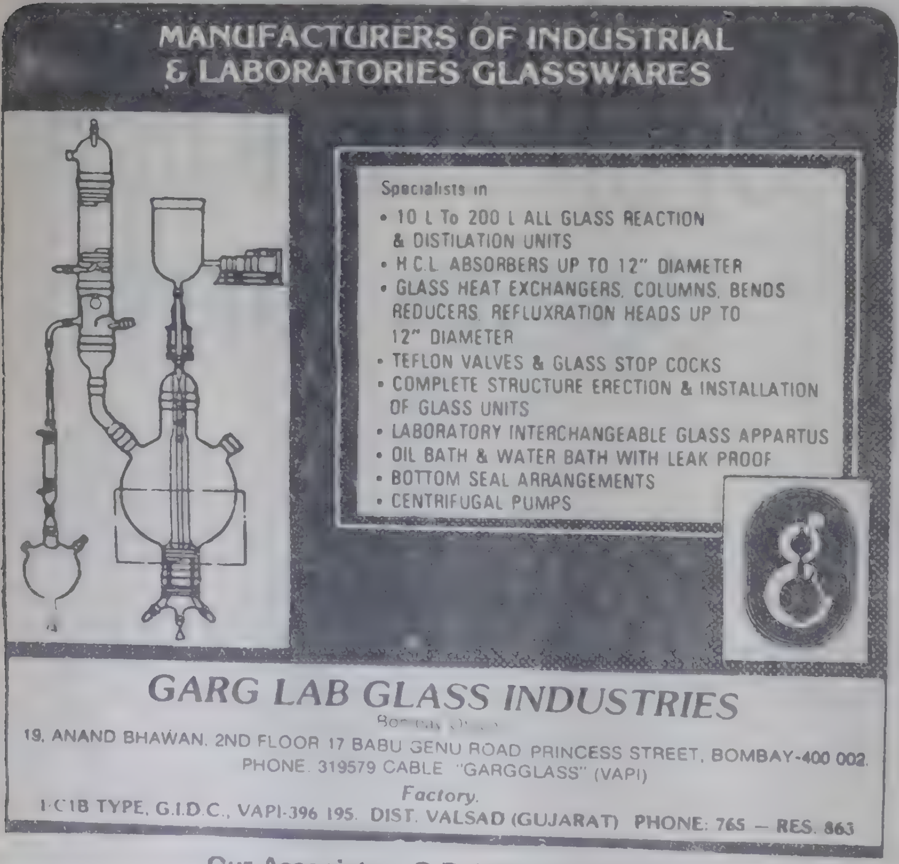
2,4 XYLIDINE : From Switzerland: Colour Chem Ltd., 15,200 Kgs., Rs. 11,76,234.

---

## PLASTIC MATERIALS IMPORTED

(From 20.4.90 to 28.4.90)

HDPE: From Argentina: Puri Electronics Pvt. Ltd., 50 Mts., Rs. 7,41,685; Rasiklal Mansukhlal & Co., 50 Mts., Rs. 7,41,685; From Belgium: Nilkamal Crates & Containers, 34.305 Mts., Rs. 6,12,947; Nilkamal Plastics & Allied Inds., 85.750 Mts., Rs. 13,09,401; From Cuba: Fibro India,


MANUFACTURERS OF INDUSTRIAL
& LABORATORIES GLASSWARES

Specialists in
- 10 L To 200 L ALL GLASS REACTION & DISTILATION UNITS
- H.C.L. ABSORBERS UP TO 12" DIAMETER
- GLASS HEAT EXCHANGERS, COLUMNS, BENDS REDUCERS, REFLUXRATION HEADS UP TO 12" DIAMETER
- TEFLON VALVES & GLASS STOP COCKS
- COMPLETE STRUCTURE ERECTION & INSTALLATION OF GLASS UNITS
- LABORATORY INTERCHANGEABLE GLASS APPARTUS
- OIL BATH & WATER BATH WITH LEAK PROOF
- BOTTOM SEAL ARRANGEMENTS
- CENTRIFUGAL PUMPS

GARG LAB GLASS INDUSTRIES
Bombay Office
19, ANAND BHAWAN, 2ND FLOOR 17 BABU GENU ROAD PRINCESS STREET, BOMBAY-400 002.
PHONE. 319579 CABLE "GARGGLASS" (VAPI)
*Factory.*
1-C1B TYPE, G.I.D.C., VAPI-396 195. DIST. VALSAD (GUJARAT) PHONE: 765 — RES. 863

Our Associates: G.P. INDUSTRIES

2.500 Mts., Rs. 1,11,731; From zechoslovakia: Associated Plastic nds., 276.5 Mts., Rs. 27,01,989; Darhit Enterprises, 25 Mts., Rs. 2,84,062; Hardik Indl. Corpn., 150 Mts., Rs. 17,04,372; Jayemko, 25 Mts., Rs. 2,85,062; From FRG: Ador Packging Ltd., 128 Mts., Rs. 24,57,158; The Swadeshi Mills Co. Ltd., 9 Mts., Rs. 1,33,956; From Hungary: Dwarkadas Velji Tarpatriwla, 31.5 Mts., Rs. 6,06,516; Overseas Trading Corpn., 14.4 Mts., Rs. 20,17,854; From Japan: Siltap Chemicals Ltd., 48 Mts., Rs. 7,81,708; From Korea: Neo Sack Ltd., 28 Mts., Rs. 3,33,064; S. Lal & Co. Ltd., 48 Mts., Rs. 7,39,758; From Saudi Arabia: Amar Plastics, 102.900 Mts., Rs. 14,74,472; From Saudi Arabia: Apurva Inds., 17.150 Mts., Rs. 2,85,823; Associated Plastics Inds., 51.450 Mts., Rs. 8,12,577; Apurva Inds., 17.150 Mts., Rs. 2,87,320; Bright Brothers Ltd., 68.600 Mts., Rs. 10,47,520; Calcutta Industries Corpn., 52.450 Mts., Rs. 7,98,130; Calcutta Rope Store, 51.450 Mts., Rs. 8,11,081; Century House Hold Inds., 17.150 Mts., Rs. 2,64,873; Evershine Plastics Inds., 17.150 Mts., Rs. 2,72,355; Everplast Pipes Pvt. Ltd., 17.150 Mts., Rs. 2,51,485; Krishna Polychem Pvt. Ltd, 17.150 Mts., Rs. 2,76,845; Nirmal Crates & Containers, 51.450 Mts., Rs. 8,08,086; Panchmal Indl. Corpn., 17.150 Mts., Rs. 2,51,405; Polyset Plastics Ltd., 17.150 Mts., Rs. 2,63,377; Polyset Products Pvt. Ltd., 34.300 Mts., Rs. 5,26,753; Premier Plastics & Chemicals, 17.150 Mts., Rs. 2,70,869; Progressive Trading Co., 33 Mts., Rs. 4,47,687; Pyarelal Tungen, 50.150 Mts., Rs. 7,83,280; Regent Plastics, 17.150 Kgs., Rs. 2,85,824; From Saudi Arabia: Shri Saslasar Plastic Pvt. Ltd., 17.150 Mts., Rs. 2,85,824; Silver Plastochem Pvt. Ltd., Rs. 2,64,874; Sofeene Plastics, 17.150 Mts., Rs. 2,85,824; Southern Blow Moulders, 34.300 Mts., Rs. 5,41,718; Southern Plastics Inds., 17.150 Mts., Rs. 2,70,859; From Singapore: Lakshman's Plastics Pvt. Ltd., 51 Mts., Rs. 8,30,271 From USA: Climax Synthetics Pvt. Ltd., 21.250 Mts., Rs. 2,85,549; Dimple Overseas Pvt. Ltd., 40,824 Kgs., Rs. 4,31,024; Grover Overseas Pvt. Ltd., 13.714 Mts., Rs. 1,84,283; Newton Plastics Inc., 14.375 Mts., Rs. 1,93,165; Pan Asia International Pvt. Ltd., 20.992 Mts., Rs. 2,91,240; Ratnajeet Finance & Invest., 101.922 Mts., Rs. 16,81,463; From Yugaoslavia : Gaurav Products, 30 Mts., Rs. 5,30,868; Monofil Plastics, 30 Mts., Rs. 5,30,868; Universal Corpn., 25 Mts., Rs. 3,23,659.

LDPE: From Cuba: Fibro India, 8 Mts., Rs. 3,90,378; From France: Omega Plastics Inds. Pvt. Ltd., 16 Mts., Rs. 2,37,358; From Saudi Arabia: Suvin Co. Extrusions Pvt. Ltd., 16,500 Kgs., Rs. 2,43,316; From Yugoslavia: Hind Polymers, 200 Mts., Rs. 29,43,143; Hind Polymers 20 Mts., Rs. 2,94,314; Indian Petrochemicals Corpn. Ltd., 1496 Kgs., Rs. 2,29,37,674; Sasmyak Udyog, 18 Mts., Rs. 2,64,456; Vindya Telelinks Ltd., 180 Mts., Rs. 26,83,342.

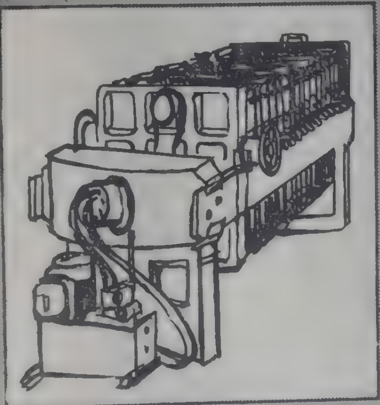
LLDPE: From Saudi Arabia: Perfect Colourants & Plastics. 16.500 Mts., Rs. 2,47,635; Sachdeva Enterprises, 39.5 Mts., Rs. 5,01,735.

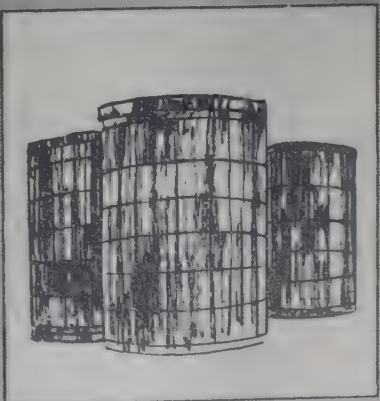
POLYOL: From USA: Aagosh Polyfoams Pvt. Ltd., 32.76 Mts., Rs. 6,14,014.

POLYACETAL RESIN: From USA: Injecto Plasto, 3,000 Kgs., Rs. 1,28,936.

POLYPROPYLENE: From Australia: Glasso Pack Pvt. Ltd., 15 Mts., Rs. 2,17,300; The Supreme Inds. Ltd., 15.75 Mts., Rs. 2,88,603; From Belgium: Chloride Inds. Ltd., 45 Mts., Rs. 8,04,946; Panorama Plastics, 7.500 Mts., Rs. 1,12,562; From China: P.K. Enterprises, 7.500 Mts., Rs. 1,12,562; Fibro India, 52.5 Mts., Rs.7,87,934; From Finland: Anant Plastics Pvt. Ltd., Rs. 2,09,417; Milton Polyplast Pvt. Ltd., 22.500 Mts., Rs. 3,13,315; Kamet Plastics (P) Ltd., 15 Mts., Rs. 2,14,652; Panorama Plastics, 30 Mts., Rs. 4,24,070; Rising Star Plastics Pvt. Ltd., 22.500 Mts., Rs. 3,13,315;

Available In All Size





FILTER PRESS, WOODEN
FILTER PLATE & FRAME

WOODEN VATS, TUBS/ TANKS
OF ANY LITRE CAPACITY

MADE FROM BURMA, VALSADI TEAK WOOD & SALWOOD

Contact Manufacturers

SHREE RANG SAW MILL
R.P. Desai Compound, Chimodia Naka, Bilimora - 396321 Dist. VALSAD
Gujarat. Phone : (O) 3713; (F) 3166 (R) 2607

From FRG: Cheviot Company Ltd., 15.400 Mts., Rs. 1,94,620; Pan Asia International Pvt. Ltd., 200.422 Mts., Rs. 23,51,510; The Supreme Industries Ltd., 45 Mts., Rs. 6,17,589; From Japan: Fum Plastic Inds. Ltd., 15.5 Mts., Rs. 2,56,972; From Singapore: Gujarat Plastics, 33 Mts., Rs. 4m36,037; From USA: Amar Taran Exports, 101.250 Mts., Rs. 12,18,447; Amar Plastics Inds., 81.250 Mts., Rs. 9,92,545; Ashwini Plastics & Chemicals, 17 Mts., Rs. 2,18,055; From USA: Ashish Trading Co., 48.990 Mts., Rs. 4,46,372; From UK: Cheviot Co. Ltd., 15.775 Mts., Rs. 1,95,261; From USA: Gayatri Plastics Inds., 16.650 Mts., Rs. 2,26,811; Milton Plastics, 45 Mts., Rs. 4,89,992; New Plastomers India Ltd., 16.650 Mts., Rs. 2,26,811; Pack Print, 16.650 Mts., Rs. 2,26,811; Milton Plastics, 45 Mts., Rs. 4,89,992; New3 Plastomers India Ltd., 16.650 Mts., Rs. 2,26,811; Pack Print, 16.650 Mts., Rs. 2,26,811; Space Age Chemplast Pvt. Ltd., 33.30 Mts., Rs. 4,46,460; From USA: Sumitra Plastics Ltd., 16.650 Mts., Rs. 2,30,536; Sampath Enterprises, 16.650 Mts., Rs. 2,26,811; United Impex Corpn., 49.55 Mts., Rs. 6,60,718; Vishal Plastomer Pvt. Ltd., 65.316 Mts., Rs. 8,14,088.

POLYPROPYLENE COPOLYMER: From Italy: Atlas Industries Corpn., 15 Mts., Rs. 3,01,037.

POLYPROPYLENE HOMOPOLYMER: From Cuba: Fibro India, 45 Mts., Rs. 6,00,765; From Singapore: Sunil Polyplast, 16 Mts., Rs. 2,51,300.

POLYPROPYLENE POLYSTYROL: From Korea: Xpro India, 152 Mts., Rs. 25,25,265.

POLYPROPYLENE RESIN: From USA: Aman Polypack Pvt. Ltd., 16.330 Mts., Rs. 2,31,231; Paharpur Plastics, 285 Mts., Rs. 38,90,573; Print Pack Packaging, 32.660 Mts., Rs. 4,62,462.

POLYSTYRENE: From Korea: Deluxe Sales Corpn., 179 Mts., Rs. 25,63,673; Dipti Enterprises, 35.152 Mts., Rs. 18,69,545; Navyug Plastics, 17 Mts., Rs. 3,54,379; From Saudi Arabia: Super Gaskettes Inds. Ltd., 1,02,000 Mts., Rs. 21,91,756.

PVC: From Brazil: NOCIL, 300 Mts., Rs. 35,26,608; Rigidor Plastics Pvt. Ltd., 100 Mts., Rs. 11,72,840; Sawatram Polymers, 50 Mts., Rs. 5,87,942; From Mexico: The Bhor Inds. Ltd., 50 Mts., Rs. 6,03,795; Stream Flow Plastics Pvt. Ltd., 100 Mts., Rs. 10,86,413; From Brazil: Ashwini Plastics Inds., 50 Mts., Rs. 5,89,563.

PVC RESIN: From Brazil: Autoplast, 50 Mts., Rs. 5,51,828; Jain Accessories & Fittings, 345 Mts., Rs. 38,23,166; Prakash Pipes Inds. Ltd., 96 Mts., Rs. 11,26,083; Premier Credits Ltd., 48 Mts., Rs. 5,63,285; Shipra Pipes Pvt. Ltd., 250 Mts., Rs. 29,31,990; From FRG: The National Leather Cloth Mfg., 94.500 Mts., Rs. 16,39,137; From Mexico: AMC Coated Fabrics Pvt. Ltd., 25 Mts., Rs. 4,26,551; Crystal Containers, 66.600 Mts., Rs. 7,95,741; Hico Enterprises, 25 Mts., Rs. 2,89,155; Jai Inds., 19.500 Mts., Rs. 2,25,344; From Romania: Anuradha Plast & Tex. Inds., 100 Mts., Rs. 11,42,864; Kalpan Mercantiles Ltd., 50 Mts., Rs. 5,70,647; Mayant Chemi Plast Pvt. Ltd., 200 Mts., Rs. 22,83,272; From Taiwan: Freemans Measures Pvt. Ltd., 2,500 Mts., Rs. 1,14,088; From Turkey: Sujala Pipes Pvt. Ltd., 393.268 Mts., Rs. 46,32,593; From USA: Panchmal Plastics Pvt. Ltd., 183.775 Mts., Rs. 20,68,600.

## DRUGS MATERIALS IMPORTED BOMBAY

**(From 20.4.90 to 28.4.90)**

CITRIC ACID BP MONOHYDRATE: From China: Haresh Chemicals, 20,000 Kgs., Rs. 2,79,220.

CITRIC ACID MONO HYDRATE BP 80: From China: Murari Chemical Corpn., 32,000 Kgs., Rs. 4,54,873.

ISOPTHALAMIC ACID BP: From FRG: May & Baker India Limited,

FOR YOUR REGULAR REQUIREMENTS OF

WHITE BEESWAX
YELLOW BEESWAX &
HONEY

PLEASE CONTACT MANUFACTURER :

MEHSONS CHEMICALS PVT. LTD.,

P.O.B. No. 121
KAMLA BHAWAN, MADARI GATE,
BAREILLY 243 001 (U. P.)
PHONES : 76517, 77359, 74150, 76526
TELEX : 0577 209 ME IN
CABLE : VEGLAMUKHI - BAREILLY

1,000 Kgs., Rs. 12,09,732.

L-TARTARIC ACID BP/IP: From Spain: Pfizer Limited, 3 Mts., Rs. 2,34,547.

PENCILLIN G POTASSIUM: From Netherlands: Lupin Laboratories Ltd., 10,000 Nos., Rs. 22,94,859; Kopran Chemical Co., Ltd., 30,708.65 Kgs., Rs. 8,93,999.

PHENYL PROPANOLAMINE HCL USP: From Japan: Sarabhai Chemicals, 16.700 Mts., Rs. 3,08,936; From France: Parke Davis (India) Ltd., 8.600 Mts., Rs. 1,59,087; From FRG: Kanth Corpn., 1,720 Kgs., Rs. 3,24,263; From Saudi Arabia: Pioma Industries, 11,180 Kgs., Rs. 1,99,009; From USA: Lupin Laboratories Ltd., 17.20 Mts., Rs. 2,89,658.

SULPHADIAZINE BP 80: From China Krishnalal Hiralal, 1,000 Kgs., Rs. 3,74,894.

---

## MATERIALS IMPORTED BOMBAY

(From 30.4.90 to 3.5.90)

---

AEROSIL 200: From Belgium: E. Merck (India) Ltd., 1860 Kgs., Rs. 2,26,907.

ALDEHYDE C12 LAURIC: From FRG: J.B. Perfumes Pvt. Ltd., 200 Kgs., Rs. 56,932.

ALDRIN TECH: From Netherlands: The National Small Inds. Corpn. Ltd., 5,250 Kgs., Rs. 7,58,411.

ALPHA OLEFIN C14-C18: From Mexico: Jai Industries, 24.960 Mts., Rs. 3,52,826.

D(-)ALPHA PHENYL GLYCINE HCL: From Italy: Armour Chemicals Ltd., 5,775 Kgs., Rs. 23,12,763.

D(-) ALPHA PHENYL GLYCINE CHLORIDE HCL: From Netherlands, Koparan Chemical Co. Ltd., Rs. 8,61,548; Wellchem Labs., 1,225 Kgs., Rs. 5,08,838.

ALDEHYDE C12 LAURIC: From FRG: J.B. Perfumes Pvt. Ltd., 50 Kgs., Rs. 14,233.

ANTHRAQUINONE: From China: Arlabs Limited, 1000 Kgs., Rs. 47,991.

ANTIMONY TRI OXIDE: From FRG: Ester Industries Ltd., 6,000 Kgs., Rs. 10,55,239.

BETA PICOLINE 398%: From USA: Lasons Engg. Co. Pvt. Ltd., 9,457 Kgs., Rs. 4,62,095.

BISPHENOL A : From Japan: N.K. Brothers, 6,000 Kgs., Rs. 1,62,298; ALA Chemicals Ltd., 2,000 Kgs., Rs. 57,590.

TETRA BROMO BISPHENOL A: From Netherlands: Bakelite Hylam Ltd., 18,000 Kgs., Rs. 7,03,641.

BUTYL ACRYLATE MONOMER: From Japan: Shah Chhaganlal Laxmichand, 14,400 Kgs., Rs. 3,51,820.

TERT BUTYL HYDROQUINONE: From USA: Bharat Jyoti, 101.7 Kgs., Rs. 35,496.

SEC-BUTYL BENZENE: From FRG: The Premier Automobiles Ltd., 1,440 Kgs., Rs. 1,50,132.

CALCIUM D PANTOTHENATE: From FRG: E. Merck (India) Ltd., 925 Kgs., Rs. 2,17,925.

CYCLOHEXYL METHYL DIMENTHOXY SILANE: From Mexico: Jai Industries, 950 Kgs., Rs. 5,07,984.

CYSTEAMINE HCL: From Japan: Ranbaxy Laboratories Ltd., 1,000 Kgs., Rs. 1,74,514.

DICYANDIAMIDE: From FRG: Cibatul Ltd., 1,000 Kgs., Rs. 41,681.

DIETHOXYLATED 2 BUTYRATE 1.4 DIOL: From FRG: Grauer & Weil India Ltd., 1,040 Kgs., Rs. 1,13,656.

DIETHYL SULPHATE: From Japan: Jaysynth Dyechem Ltd., 15,640 Kgs., Rs. 3,17,589: From Japan: Pigments & Allied, 5,060 Kgs., Rs. 1,18,651.

FILTER CLOTHS

FILTER CLOTHS

In Cotton, Nylon, Acrylic polyester Fibre polypropylene. P.V.A., P.V.C. are manufactured in over 400 Varieties and also Supplied as per your specifications and requirements. prices are competitive.
Our full-fledged technical department is ready to assist you.

Please contact for further details and sample.

BHARAT INDUSTRIAL CORPORATION
TELEX: 011-72262 DRAG IN.
90, BHAJIPALA LANE TAVAWALA, BLDG. BOMBAY 400 003.
GRAM: "BHARATTUBE", BOMBAY - 400 003.
PHONE: 341920, 341869, 335759 ■ RESI.: 5134142

DIBENZOYL PEROXIDE: From Japan: Datacorp Systems, 4,000 Kgs., Rs. 4,44,932.

DIMETHYL DIPROPYLENE TRIAMINE: From FRG: Cibatul Ltd., 3,960 Kgs., Rs. 6,04,313.

DIMETHYL FORMAMIDE: From Japan: S.D. Fine Chem. Ltd., 5,130 Kgs., Rs. 94,002; Cipla Ltd., 15,200 Kgs., Rs. 2,51,840.

DIMETHYL HEXANOIC ACID: From France: Technoaid Products, 14,800 Kgs., Rs. 2,71,194.

DIMETHYL ISOPHTHALATE: From Japan: Data Corp. Systems, 4,000 Kgs., Rs. 2,34,896.

DIMETHYL SULFOXIDE: From FRG: The Premier Automobiles Ltd., 7,000 Kgs., Rs. 97,728.

ETHYL HEXYL ACRYLATE: From Taiwan: Asmaco Plastic Inds., 13,600 Kgs., Rs. 3,99,363.

FERRIC OXIDE: From Japan: Cosmo Ferrites Ltd., 36,000 Kgs., Rs. 3,80,092.

GUM ROSIN: From China: Ballarpur Industries Ltd., 49.950 Mts., Rs. 4,25,389.

GUM ROSIN WG GRADE: From Indonesia: Goodlass Nerolac House Ltd., 18 Mts., Rs. 1,58,634.

1:6 HEXANE DIOL: From Japan: Atic Inds. Ltd., 5,130 Kgs., Rs. 3,53,626.

HEXACHLORO CYCLO PENTADIENE: From USA: Bharat-Pulverising Mills Ltd., 53.343 Mts., Rs. 17,03,566.

HYDROXYLAMINE SULPHATE: From Japan: Apte Amalgamations Ltd., 36,000 Kgs., Rs. 8,85,847.

BUTYLATED HYDROXY ANISOLE: From Japan: Bharat Jyoti, 91.240 Kgs., Rs. 56,731.

HYDROXYETHYL CELLULOSE: From Mexico: Jai Industries, 1,000 nos. Rs. 80,276.

IODINE CRUDE: From China: Atu Products Ltd., 5,400 Kgs. Rs. 16,30,310.

ISOBUTYRIC ACID: From FRG: Standard Synthetics, 2,000 Kgs., Rs. 55,852.

ISO OCTYL THIOGLYCOLATE: From FRG: ALA Chemicals Ltd., 8,400 Kgs., Rs. 4,09,896.

ISO PROPYL ALCOHOL: From Taiwan: S.D. Fine Chem Ltd., 12,800 Kgs., Rs. 1,55,248.

MONO METHYL ACETO ACETAMIDE: From Mexico: Jai Industries, 16 Mts., Rs. 3,91,920; Jai Industries, 48 Mts., Rs. 11,75,760.

MONO-N-METHYL ACETO ACETAMIDE: From USA: Sudarshan Chem Inds., Ltd., 15,480 Kgs., Rs. 4,16,027.

N-METHYL PYRROLIDONE: From USA: Jaysynth Dyechem Ltd., 1,043Kgs., Rs. 79,547.

NOVOLDIAMINE: From FRG: E. Merck (India) Ltd., 4,950 Kgs., Rs. 19,87,722.

OCTOIC ACID: From FRG: Atic Inds. Ltd., 2,065.7 Kgs., Rs. 4,30,501.

ORTHANILIC ACID: From FRG: Atic Industries Ltd., 2.065.7 Kgs., Rs. 4,30,501.

ORTHO NITRO TOLUENE: From Mexico: Jai Industries, 10,764 Kgs., Rs. 1,87,848.

PARA CHLORO TOLUENE: From Japan: Rallis India Ltd., 16,000 Kgs., Rs. 4,91,432.

PARATOLUIDINE META SULPHONIC ACID: From UK: Pidilite Industries Ltd., 3,000 Kgs., Rs. 1,96,256.

3-PROPIONOLAMINO-N-DIETHYL ANILINE: From Japan: Sarana Dyestuff Inds. Ltd., 1,200 Kgs., Rs. 5,82,179.

PROPIONIC ACID: From FRG: Transpek Industry., 50,400 Kgs., Rs. 7,42,937.

MARK OF QUALITY
NOW AVAILABLE IN ANY QUANTITY
AS AND WHEN REQUIRED BY YOU

**BENZYL CHLORIDE**
**BENZO TRI CHLORIDE**
**BENZOYL CHLORIDE**
**BENZALDEHYDE**

**GWALIOR CHEMICALS PVT. LTD.**

**Factory:**
Birlagram
NAGDA - 456 331.
(M.P.)
**Phone: 283/104**

**Regd. Office:**
29, Bank Street, 1st Floor,
BOMBAY 400 023.
**Phone: 2862453/2863021**
**Gram: "METALDIST"**
**Telex: 011-6554 MINA IN.**

**M.E.K. PEROXIDE**
**BENZOYL PEROXIDE**

**QUALITY * RELIABILITY * CONSISTENCY**

Manufacturers

**ROMA CHEM INDUSTRIES**

**Regd. Office: 22/1044, Punjabi Colony, G.T.B. Nagar, Bombay 400 037.**
**Phones: 4073074/4092216/4093914 Resi.: 483095**
Sales Office: Municipal Building, C-1, Shop No. 2 & 3,
Near Sardar Nagar, No. 4, G.T.B. Nagar, Bombay 400 037.

**SPECIAL PRICE FOR BULK QUANTITY**

| | |
|---|---|
| Rs. 130/- | Benzyl Triethyl Ammonium Chloride (TEBA Chloride) |
| Rs. 225/- | Tetra Ethyl Ammonium Bromide (TEAB) |
| Rs. 450/- | Tetra Butyl Ammonium Bromide (TBAB) |
| POR | Butyl Triethyl Ammonium Bromide (BTAB) |
| POR | Benzyl Triethyl Ammonium Bromide (TEBA Bromide) |

CONTACT MANUFACTURERS & EXPORTERS

**HEM CORPORATION** Phone: 252250, 319990
7-Devkaran Mansion, 24/B-Vithaldas Road, Princess Street, Bombay 400 002.

We BUY-CHEMICALS — Surplus/Recovered/By-Product

**Available Regularly Quality Product at Competitive Rate**

**GUANIDINE NITRATE**

**(Extra Pure - Extra White)**

Contact Manufacturers:

**REGAL CHEMICALS**

208, Faiz-E-Qutbi, 375, Narsi Natha Street, Bombay 400 009.
Tel.: 333605/343391 Resi.: 0215-681182
**Telex: 011-76729 RCSC IN**
**Gram: "SUDHICHEMI"**

**Ion Exchange Resins**
**Water Treatment Plants & Chemicals**
**Reverse Osmosis Plant**

- Anthrecite Powder
- 1:4 Butanediol (German)
- Behenyl Alcohol
- Geranium Oil
- Lanasyn Green 5GL Acid Dyes
- 2 Methyl Chloro Propionate
- Neopentyl Glycol
- Neozopon Orange 245
- Neozopon Yellow 157
- Nylosan Scarlet 4G 125%
- Nylosan Scarlet F 36L
- N. Methyl Pyrrolidone
- Polyol, T.D.I. & M.D.I. for Polyurethane & Rigid Foam
- Solsperse (ICI)
- Triethanolamine Lauryl Sulphate
- Vestowax SH 105

Please Contact:

**M/s. DOSHI & COMPANY**

7, Fremjivan, 87, Kazi Sayed Street, Khand Bazar, Bombay 400 003.
Phones: 343480 Resi.: 455147/462564
Ahmedabad: Phone: 831156, 833302. Resi.: 407909 Gram: DHIRENCHEM, Dadar, Bombay.

---

**ANISIC ALDEHYDE**

**NITROBENZENE * C.T.C. * CHLOROFORM**

**N-HEXANE * PHOSPHORIC ACID**

- MMA Monomer
- Cyclohexanone
- Ethyl Cellosolve
- Butyl Acetate
- Butyl Cellosolve
- N-Butanol
- Toluene
- Benzene
- Xylene
- Acetone/EDC
- I.P.A./M.E.K.
- M.I.B.K.
- E.P. 60-80/40-60
- Trichloroethylene
- D.O.P./D.B.P.

**AJMERA CHEMICALS**
276/78, Samuel Street, 3rd Floor, R. No. 21, Bomba
Ph.: 325756/332325 Resi.: 6825148

---

**Potash Alum - 99% Min.**

**Basic Chromium Sulphate**
**Sodium Sulphide Flakes** (Iron Free)
**Potassium Carbonate**
**Barium Carbonate/Chloride**
**Calcium Chloride**
**Potassium Bromate**
**Sodium Bromate**

**VORA CHEMI TRADE**
**PVT. LTD.**

265, Samuel Street, Bombay 400 003.
Phones: 333762/63/64/325265/34537

THE IDEAL SOURCE FOR CHEMICALS

AUTHORISED DISTRIBUTORS OF GNFC:

**FORMIC ACID 85%**

AUTHORISED DISTRIBUTORS OF R.C.F.:

**SODIUM NITRATE • SODIUM NITRITE**
**AMMONIUM-BI-CARBONATE • METHANOL**

AUTHORISED DISTRIBUTORS OF GSFC:

**MEK OXIME (ANTI-SKINNING AGENT)**

DEALER OF CENTURY RAYON:

**ANHYDROUS SODIUM SULPHATE**

DEALER OF HOC:

**ACETONE**
**PHENOL**

AUTHORISED STOCKIST OF TTP:

**TITANIUM DIOXIDE**

DEALER OF STANDARD ALKALI:

**CAUSTIC SODA LYE**

*"WE ARE GROWING STRONGER WITHOUT LOOSING OUR PERSONAL TOUCH"*

POPAWALA & CO.

1502, MAKER CHAMBERS V, 221, NARIMAN POINT, BOMBAY-400 021. INDIA
CALL: 23 01 56 • 24 45 93 • 287 11 15 TELEX: 011-4164 POP IN

REGD. NO. TN/MS (C) 395 ISSN 0045/6500 R. N. NO. 1972/57

THE SYMBOL OF PURITY
IN INDUSTRIAL SOLVENTS
ISC
ELECTRONICS
COSMETICS
SURFACE
COATING
DRUGS &
PHARMACEUTICALS
NOCIL
Authorised Distributor

Industrial Solvents & Chemical Company offers naked products at competitive prices ex-Thane Godown from four separate filling points. Of-course, ISC continues to supply original barrels of these NOCIL CHEMICALS: IPA-CBM, NBA, OCTANOL, Acetone, DIACETONE, DAA, MIBK, IBA, EDC, Isopropanol, Butanol, 2-Ethyl Hexanol, MEG, DEG and Polyethylene Glycol 200/300/400/600/1500, CELLOSOLVE, CARBITOL, Sanotol EAU & EGU (mixture of Polyethylene Glycol ethers)

For Your Requirements Please Contact

*Industrial Solvents & Chemical Co.*

85, NARIMAN BHAVAN OPP. HOECHST HOUSE 227, NARIMAN POINT
BOMBAY-400 021 TEL : 2028162/2024774 GRAM : INSOCHEM

D. NO. TN/MS (C) 395

35th
YEAR OF
PUBLICATION

ISSN 0045/6500
R. N. NO. 1972/57

# Chemical Weekly

VOL. XXXV AUGUST 7, 1990 NO. 48

New generation plasticizer is here!

**BENZOPLAST**™

The superior alternative to DOP

**BENZOPLAST**™

Improves your quality.
Reduces your cost.

Leading manufacturers of PVC leather cloth, PVC cables, plastisol, adhesive, rubber products, PVC footwear, PVC tapes, films, etc. are already using BENZOPLAST in place of DOP.

For detailed information, booking orders and technical assistance contact our Marketing Division.

**GANESH BENZOPLAST LTD.**
145-A, Dr. Viegas Street, Kalbadevi, Bombay 400 002.
Phone: 317993, 253438, 298476. Telegram: BENZACID
Telex: 011-3906 GNES IN. Fax: 91(22) 2863768

*Benzoplast — perfects your products*

*Manali Petrochemical Ltd.*

with Technical Collaboration
of *ARCO* of U.S.A.
have pleasure to announce the commencement
of production of the following products:

**PROPYLENE GLYCOL IP/TECH**

**DI PROPYLENE GLYCOL**

**TRI PROPYLENE GLYCOL**

**DI CHLOROPROPANE**
**(PROPYLENE-DI-CHLORIDE)**

**PROPYLENE OXIDE**

Please Contact our

**CONSIGNMENT STOCKIST & INDENTING AGENTS**
(for Maharashtra, Goa, Dadra, Nagar Haveli, Daman & Diu)

*M/s. Jupiter Dyechem Pvt. Ltd.*

64-B Wing,
Mittal Court, 6th Floor,
Nariman Point,
Bombay 400 021.

Tel. No. 2048975/224880/2860141/2863604
Telex: 011-83730 RKC IN

SEE PAGE 39 FOR CONTENTS

SILICA GEL
(INDICATING/NON-INDICATING/COLUMN CHROMATOGRAPHY/THIN LAYER CHROMATOGRAPHY)
ACTIVATED CARBON
(POWDER/GRANULAR; CHEMICALLY ACTIVATED)
PRECIPITATED SILICA
(RUBBER GRADE/INSECTICIDE GRADE)

BUTYL STEARATE
METHYL OLEATE
COCOAMINE OXIDE
COCO DI ETHANOLAMIDE
COCO MONO ETHANOLAMIDE
COCO AMIDOPROPYL BETAINE
OCTYL STEARATE
PARA CHLORO ANILINE
COCO BETAINE
BENZALKONIUM CHLORIDE

ORTHO DICHLORO BENZENE
PARA DICHLORO BENZENE
ORTHO PHENYLENE DIAMINE
MONO CHLORO BENZENE
TRI CHLORO BENZENE
BENZYL CHLORIDE

ISO PROPYL MYRISTATE
ISO PROPYL PALMITATE
ISO PROPYL ALCOHOL
DIOCTYL SULPHO SUCCINATE LIQUID

DRIER CHEMICALS

100, Dada Saheb Phalke Road,
Dadar (East),
BOMBAY 400 014 (INDIA)

Tel.: 4111051-4111661
Resi.: 4221658

Please Contact for Prompt Supplies Of:

**Anhydrous Ammonia Gas**

**IN CYLINDERS AND ROAD TANKERS**

**Also Available LIQUOR AMMONIA in Carboys and Tankers**

***Surat Ammonia Supply Company***

105, Regent Towers, Race Course Circle, Baroda 390 007.
**Phones: 323827, 321897 & 320676 * Gram: SASCO * Telex: 0175-497 SASC-IN**

**Ahmedabad Office:** M.H. ENTERPRISES, Plot No. 2018, GIDC, Vatva Phase II, Ahmedabad.
**Tel. No. Office: 336279, 348873**

**Ankleshwar Office:** J-3435, G.I.D.C. Estate, Ankleshwar-393 002, Gujarat State. **Phone: 2449.**

**Hyderabad Office:** SUPERCHEM AGENCIES, Godown No. 1, Behind Bakelite Hylam, Industrial Es
Sanathnagar, Hyderabad-500 018. **Telephone No. 263812.**

**Poona Office:** POONA GAS & CHEMICAL CO., Ratnakar, 8/16, Karve Road, Poona-411 004.
**Phones: 431110, 420330, 421695.**

**Vapi Office:** Shed No. 19, C-1, B. Type, Vapi Industrial Estate, G.I.D.C., Vapi-396 195. **Phone: 685**

***BOMBAY AMMONIA & CHEMICAL CO.***

204, B-Wing, Neelam Centre, 2nd Floor, Hind Cycle Road, Behind Glaxo, Worli, Bombay 400 025
**Phones: 4948652/4948659/4949544/4946686.**

**RSG Your Local Source of Quality Chemicals**

UB PETRO PRODUCTS LTD. : **PROPYLENE GLYCOL MONO-DI & TRI**
COAL INDIA LTD. (Dankuni Coal Complex) : **CRESOLS/XYLENOLS**
ALLIED AROMATICS LTD. : **MALEIC ANHYDRIDE, FUMARIC ACID**
CARBON & CHEMICALS INDIA LTD. : **CARBON BLACK**
BINDAL INDUSTRIES : **HYDRATED LIME**
POLYCHEM LTD. : **POLYNOLS**
RADIANT AGRO CHEM PVT. LTD. : **OXALIC ACID**
ADITYA BUILDERS : **HYDROQUINONE**
BASF : **PALEGAL/SEDIPUR TF:2/PVP K-30 TETRAHYDROFURAN**
PERIYAR CHEMICALS LTD. : **FORMIC ACID**
TAN INDIA LTD. : **SORBITOL**
STAR CHEMICALS (BOM) PVT. LTD. : **PHOSPHORIC ACID**
STANDARD ALKALI : **CAUSTIC SODA LYE/FLAKES/CAUSTIC POTASH/LIQUID CHLORINE/ POTASSIUM CARBONATE/HYDROCHLORIC A**
TAMIL NADU CHEMICAL PRODUCTS LTD. : **SODIUM HYDRO SULPHITE**
TRAVANCORE TITANIUM PRODUCTS LTD. : **TITANIUM DIOXIDE**
NEYVELI LIGNITE CORPN. LTD. : **PHENOL/ORTHO CRESOL/XYLENOL/LECO/ MULTIVALENT PHENOL/METAPARA CRESOL**
ASIAN PEROXIDES LTD. **HYDROGEN PEROXIDE**

For more information or to order please contact:

**M/s. RAMNIKLAL S. GOSALIA**

17/21, Issaji Street, 308-310, Parshva Chambers, Vadgadi, Bombay 400 003.
**Tel: 327314/24/03 * Tlx: 011-76882 RSG IN * Gram: NEW LUCKY**

IMPORTED RAW MATERIALS AVAILABLE
WITH **MODVAT & DUTY DRAW BACK** BENEFITS

**PHARMACEUTICALS, COSMETICS FOODS**

* PROPYLENE GLYCOL U.S.P.
* AEROSIL - 200 N.F.
* P.V.P. K-25/30/90 U.S.P.
(PLASDONE/KOLLIDONE/POVIDONE)
* ETHYL CELLULOSE N.F.
N-7, 10, 20/22, 45/50, 200
* METHYL CELLULOSE N.F.
Grades: CULMINAL-MC 400, 4000 CPS
* HYDROXY ETHYL CELLULOSE
Grades: NATROSOL 250 LR/GR/MR/HBR
* HYDROXY PROPYL CELLULOSE N.F.
Grades: KLUCEL EF/LF/GF/HF
* HYDROXY PROPYL METHYL CELLULOSE
U.S.P.-2910
METHOCEL/PHARMACOAT/METOLOSE
METHOCEL E3/E5/E15/E50, E-4M, F-4M
METHOCEL K-100, K-4M, K-15M
PHARMACOAT 603, 606, 615
* MICROCRYSTALINE CELLULOSE U.S.P./N.F.
AVICEL PH 101/PH 102/RC-581/RC-591
* CROSSLINKED NaCMC, U.S.P.
AC-DI-SOL (TABLET DISINTEGRANT)
* SODIUM STARCH GLYCOLATE U.S.P.
* CROSPOVIDONE U.S.P. (DISINTEGRANT)
KOLLIDONE CL/POLYPLASDONE XL
* SODIUM CARBOXY METHYL CELLULOSE
(FOOD/DENTAL/U.S.P. GRADES)
* TITANIUM DIOXIDE U.S.P. (SUPERWHITE)
ANATASE GRADE - BACTERIA CONTROLLED
* CARBOMER/CARBOPOL 934, 940
* VEE GUM/VEE GUM HV
* XANTHAN GUM
* PARA CHLORO META CRESOL B.P.
(PREVENTOL CMK - CHLOROCRESOL)
* P.E.G. 400/4000/6000/8000
* POLYPROPYLENE GLYCOL (P.P.G.)
* EUDRAGIT (ALL GRADES)
* DL-LACTIC ACID, 88-92%, U.S.P.
* POLYSORBATE (TWEEN 80) U.S.P.
* VANILLIN/ETHYL VANILLIN
* N-METHYL-2-PYRROLIDONE (NMP)
* TERTIARY BUTYL HYDROQUINONE
(ANTIOXIDANT - T.B.H.Q.)
* OPADRY
* CELLULOSE ACETATE PHTHALATE U.S.P.
* HYDROXY PROPYL METHYL CELLULOSE
PHTHALATE U.S.P.
* POLYVINYL ACETATE PHTHALATE U.S.P.

**BULK DRUGS INTERMEDIATES**

* TETRAHYDROFURAN
* TERTIARY BUTYL AMINE
* N-PROPANOL PURE (Undenatured)
* HYDROXYLAMINE HYDROCHLORIDE
* ADIPIC ACID
* BENZALDEHYDE

PLEASE CORRESPOND WITH MR. MUKESH KAMDAR / MR. HARISH SHAH
AT

**CROWN CHEMICAL PRODUCTS**

**AT OUR NEW OFFICE ADDRESS**

305-B, NEELAM CENTRE, IIND CYCLE ROAD, WORLI, BOMBAY - 400 025
TELEPHONE: OFFICE: 493 7725
493 7726
493 7727
493 4141
RESI: 409 3892
407 5245
646 3287
TELEX : 011-73926 CRWN IN
TELEFAX: 2040390

India's Multinational and Leading Consumers prefer only KGI's Gum
The top quality products
For Your Regular Requirements of:

**Gum Accacia**
(Powder & Crystal)

**Guar Gum**
(Pharma & All Other Grades)

**Gum Tragacanth**
(BPC Standard)

**Gum Arabic * Clove Oil**

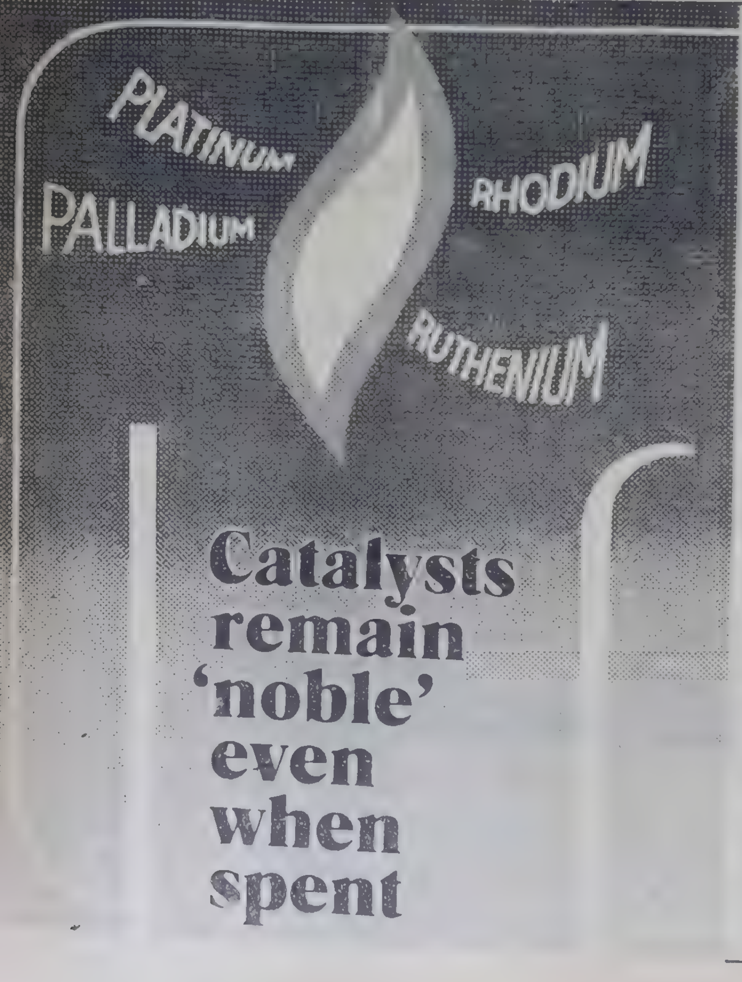
WE CAN SUPPLY AS PER NEW I.P. 1985
WITH MICROBIOLOGICAL TEST

Please Contact:

**KAPADIA GUMCHEM INDUSTRIES**

Together We Progress

G.P.O. Box No 1160, 3 Mint Road, 2nd Floor, Opp. G.P.O., BOMBAY 400 001.
Phones: 2611087/2615073/2617217 Resi.: 6205517/6207028 Gram: PHARMAGUM
Fax No.: 91-22-2612659 Attn.: Mr. RAMESH KAPADIA



**And when it comes to recovery there's none quite like us.**

We undertake recovery of noble metals from customer's spent catalysts and return them in the form of fresh activated catalysts like 1%, 3%, 5%, or 10% Platinum or Palladium on carriers like activated charcoal, barium sulphate or calcium carbonate or convert them into metals or salts like PALLADIUM CHLORIDE, RHODIUM TRICHLORIDE TRIHYDRATE, CHLOROPLATINIC ACID, PLATINUM OXIDE (ADAM'S CATALYST

We also manufacture salts of Silver, Gold and Platinum group metals

For further details contact:

**parekh platinum pvt. ltd.**

- 16B, Samhita Ind. Estate, Off Andheri Kurla Road, Bombay 400 072 INDIA.
- Cable: GOLDMARKET
- Phones: 320675, 344274 5126801, 5124798
- Telex: 011-72104 PTRH

NOW AVAILABLE:

**96% A.D. DODECYL BENZENE SULPHONATE**
(HARD ACID SLURRY)

**LINEAR ALKYL BENZENE SULPHONATE**
(SOFT ACID SLURRY)

**SULPHONATED WITH SULPHUR TRI-OXIDE**

MANUFACTURERS:

TRADE MARK

***Arochem Silvassa Pvt. Ltd.,***
Industrial Estate, Silvassa-396 230 -- Via Vapi,
Dadra & Nagar Haveli.
**Phone: 289, 291 Gram: AROCHEM SILVASSA**
**Telex: 0185 201 ARCM IN**

**BOMBAY** : Scent House, Station Road, Goregaon (West), Bombay-400 062.
**Phone: 6722280, Gram: AROSILVASSA, Telex: 011-78077 FAIS IN**
**KANPUR** : Chemdet Enterprises, Shop 67, 75/232, Sabji Mandi, Kanpur.
**Gram: SCENTOUS, Telephone: 64551**
**MADRAS** : Syndet Enterprises, 90, Govindappa Naick Street, Madras-600 001.
**Gram: SCENTOUS, Telephone: 569032**
**DELHI** : B. Shantilal & Co., 1025/5, First Floor, Gali Teliyan, Tilak Bazar, Delhi-110 006.
**Gram: INDOSIL, Telephone: 291 3973/0649**

---

*AVAILABLE REGULARLY*

***SPRAY DRIED 40%***
***A.D. ANIONIC DETERGENT***
***POWDER NEUTRAL-pH: 7-7.5***

**In Snow White Colour & Free Flowing**
**Bulk Density below 0.3**

Manufacturers

***Silvassa Syndet Private Limited***

Amli Industrial Estate,
SILVASSA - 396 230 -- Via Vapi,
Dadra & Nagar Haveli
(Phone: 685)

For most competitive quotation, best quality, prompt delivery of

| | |
|---|---|
| CLOVE OIL | (Pharma Grade |
| CINNAMON OIL | (Pharma Grade) |
| ANETHI OIL | (Pharma Grade) |
| CASSIA OIL | (Pharma Grade) |
| AJOWAN OIL | (Pharma Grade) |
| ORANGE OIL | (Pharma Grade) |
| CINNAMON LEAF OIL | (Pharma Grade) |
| ALMOND OIL | (Pharma Grade) |
| LEMON OIL | (Pharma Grade) |

Please Contact Manufacturers:

**CHEMICAL PROCESS CONSULTANTS**

Unit 202, Adarsh Ind. Estate, Sahar Road, Chakala, Andheri (East), BOMBAY 400 099.
Tel: 6325855 Gram: KEMIPROSS

**EXTRA STRONG**
**PROCESS GLASS EQUIPMENT**

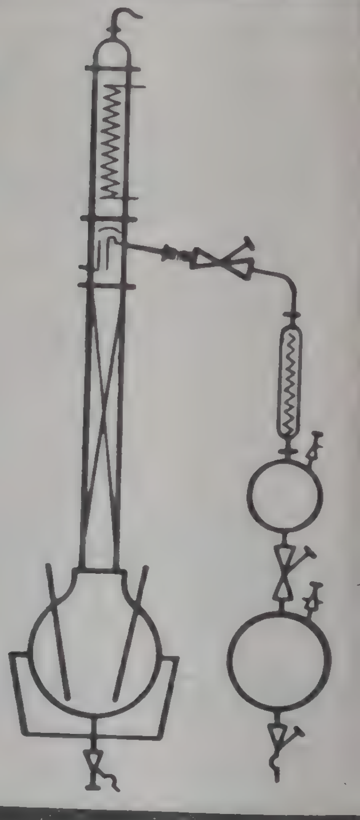
goel Introduces XTRONG range

OUR PRODUCTS : BOROSILICATE Glass Vessels, Pipe sections, Reducers, Tees, Bends. Valves, Column, Sections, Reflux Dividers, Heat Exchangers, Stirrers, Sight Glasses, Couplings and Teflon items and their installation.

OUR SPECIALITIES :

High Vacuum Reaction & Distillation Units
HCl Absorbption/Generation/Distillation Units,
Pipe Line/Column Components of 9" & 12" Dia.
Liquid/Liquid & Solid/Liquid Extraction Units.

**goel scientific works pvt. ltd.**
D/35, Sardar Estate, BARODA-390 019.
Ph. : 541692 Tlx. : 0175 565 GOEL IN



**AVAILABLE REGULARLY**

**MONOCHLORO ACETIC ACID**

Please Contact

BAJAJ

**BAJAJ ORGANICS (P) LTD.**

102, Yogeshwar, 135/139, Kazi Sayed Street, Bombay 400 003.
**Telex: 11-75969 BJAJ-IN** **GRAM: CAUSTICLYE**
**Phone: 348406/335133/333171** **Resi.: 653581**

*Branch Office:*

Arunodaya Apartments,
1st Floor,
Room No. J,
7-1-70, Dharam Karan Road, Ameerpet,
HYDERABAD 500 016.
**Phone: 228004/36472**
**Telex: 425-2163 BJAJ IN**
**Gram: CAUSTICLYE**

89, Chandan Society,
Opp. Yashoda Nagar Tekro,
Ahmedabad Bombay Highway,
Yashoda Nagar,
AHMEDABAD.
**Phone: 834546**

ATTENTION ▶ END USERS, EXPORTERS

YOUR SEARCH FOR THE BEST QUALITY OXALIC ACID ENDS HERE!

OVER 99% PURITY

Paschim Chemicals Pvt. Ltd.

**Admn Office:**
402, Chartered House. 293/299
Dr. Cawasji Hormasji Street,
Marine Lines Bombay-400 002.
Tel 253421, 297158.

**Regd. Off:**
524, Cotton Exchange
Kalbadevi Road
Bombay 400 002
Tel: 314637

The most reliable name in Chemica

DIAMINES

International quality Indigenously available

AMINO ETHYL PIPERAZINE (AEP)
- Epoxy Curing Agents
- Corrosion Inhibitors
- Asphalt Additives
- Emulsifiers
- Pharmaceuticals
- Surfactants

For Rubber and other Polymers, Lubricating and Fuel Additives, Electroplating, Mining and Metal Recovery, Coating and Adhesives, Surfactants and Softeners.

TETRA ETHYLENEPENTAMINE (TEPA)

PIPERAZINE (PIP) ANHYDROUS

Intermediate for Pharmaceuticals, Rubber Accelerators, Corrosion Inhibitors and Surface Active Agents

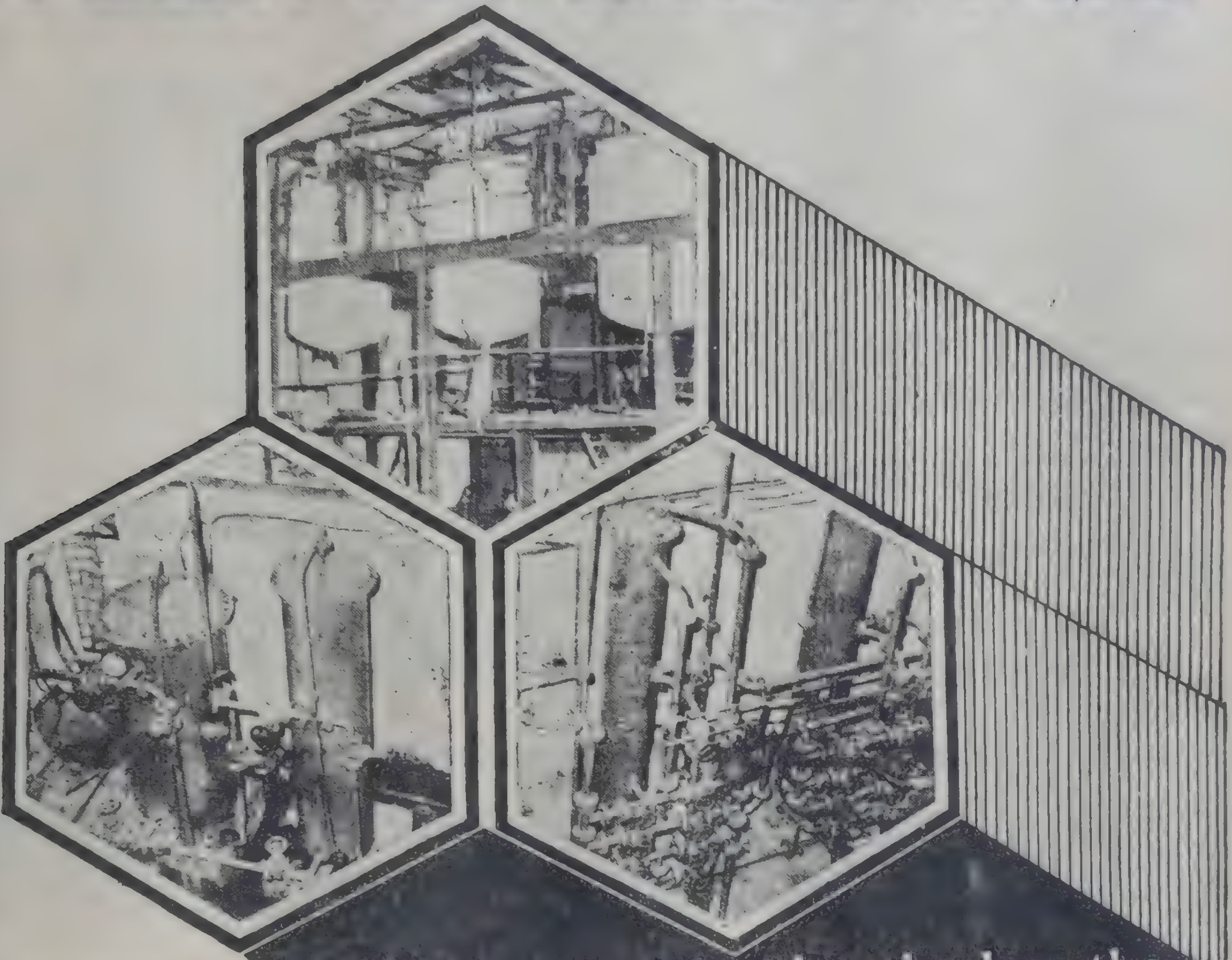
From the only manufacturers in India

DIAMINES AND CHEMICALS LIMITED
International Quality with Indigenous Ingenuity.

**Ahmedabad (H.O) :** 1 National Chambers Ashram Road
Ahmedabad 380 009 Phone 409626 Gram . DIAMINES
**Baroda (Works) :** Plot No 13, P.O. Petrofils - 391 347, Dist. Baroda
Phone 73305/406 Gram DIAMINES Telex 0175 352 DACLIN
**Bombay Office :** 85 C Wing, Mittal Towers, 8th Floor, Nariman P
Bombay - 400 021. Phone : 2029507. Gram : CELAGAR

Novnit/307

# PLASTI PIGMENTS PVT. LTD.



When you consider the lengths PPPL goes to give service with good quality, everything it manufactures is surprisingly economical.

Manufacturers of:

Benzoyl Peroxide
Powder & Paste form.
Methyl Ethyl Ketone Peroxide.
Tertiary Butyl Hydro Peroxide.
Tertiary Butyl Per Benzoate.
Di-Tertiary Butyl Peroxide.
Cyclohexanone Peroxide.
M.I.B.K. Peroxide.
Synthetic Pearl Essence
various grades.

NO WONDER B.A.R.C., B.A.S.F.
BAKELITE HYLAM LIMITED.,
ENTRUST THEIR ENTIRE
REQUIREMENT OF PEROXIDE
CATALYSTS TO PLASTI PIGMENTS

**PLASTI PIGMENTS PVT. LTD.**
401, SAI CHAMBERS,
365/367 NARSI NATHA STREET
BOMBAY-400 009
Tel [illegible]37890 [illegible]3688

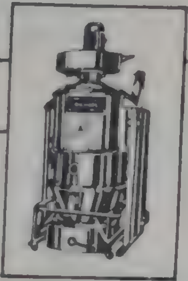
WHERE SERVICE IS A WAY OF LIFE

# R. SQUAR & CO.

*MANUFACTURERS OF:*

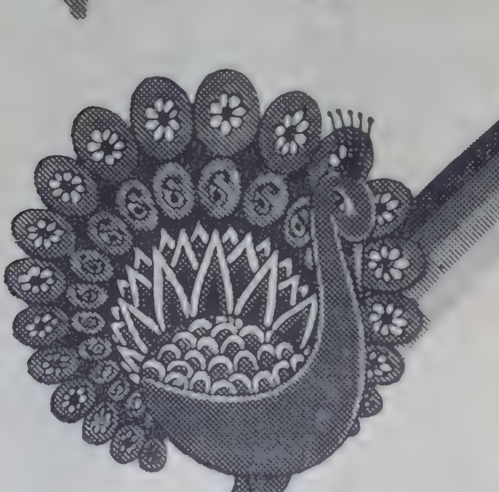
**TRAY DRYER, FLUID BED DRYER, DISH ENDS, CENTRIFUGE, GRANULATOR, ICE CRUSHER, PRESSURE VESSELS & OTHER CHEMICAL EQUIPMENTS.**

**MEET US AT:**



**R. SQUAR & CO.**
**M.I.D.C. CHEMICAL ZONE, AMBARNATH-421501.**
**PHONE: 2785**

EVERY COLOUR UNDER THE SUN



## ...TO BRIGHTEN U YOUR FABRICS

We manufacture Napthols Intermediates under quality control through our R & D Department

1. NAPTHOL AS
2. NAPTHOL ASBS
3. NAPTHOL ASBO
4. NAPTHOL ASOL
5. NAPTHOL ASTR
6. NAPTHOL ASD
7. NAPTHOL ASG
8. NAPTHOL ASSW
9. NAPTHOL ASE
10. PARA NITRO ANILINE (P
11. ORTHO NITRO ANILINE (ONA)
12. ORTHO PHENYLENE DI-AMINE (OPDA)

AND MANY OTHERS...

MANISH

**Manish** PRODUCTS

Office: 15-A, Haresh Chambers, 3rd Floor,
313-319 Samuel St., Vadgadi, Bombay-400 003,
Phones. Off.: 327629, 349605.
Resi.: 6490400, 6494762 Gram: "TAWATA"
Factory: A/80, M.I.D.C. Phase I, Dombivali (Eas
Dist. Thana, MAHARASHTRA.

**Manish**
HIGH QUALITY DYES IN A WIDE VARIETY

**The Planet Earth is the greatest chemist we know.**

What fecund and creative chemistry.
Every human, plant, animal, rock, gas or liquid
on earth has a simple or complex chemistry
behind it. The idea of so much thought and
unconscious formulation seems mind-boggling,
but Nature does it regularly and effortlessly.
It inspires us.

Process chemicals for the textile industry for Sizing, Desizing,
Mercerising, Scouring, Dyeing, Printing and Finishing.

SUPERTEX

SUPERTEX ®
(INDIA) CORPORATION
132, Dr. Annie Besant Road, Bombay-400 018
Phone: 493 6041, 493 38 18, 493 5482.
Grams: Thinogum Telex: 75643.

a M.G. Saraf Enterprise
Most trusted name in chemicals.

**FOR YOUR REQUIREMENTS OF:**

**TRICHLOROETHYLENE**
**PERCHLOROETHYLENE**
**AND**
**TETRACHLOROETHANE**

Contact

For North India:
**M/s. B.S. MEHRASONS PVT. LTD.**
B-1/14, Ashok Vihar Phase II, Delhi 110 052

**Phones: 741742/7118800/2512975/2916979**
**Telex: 031-78005 PEC IN**

For Maharashtra & Goa:
**M/s. PHARMA CHEMICALS**
302, Karsan Natha Trust Building,
330, Samuel Street, Vadgadi, Bombay 400 00
**Phones: 344115/342889/337417**
**Telex: 011-73635 BSM IN**

Consignee Agents & Stockists of:

**M/s. THE METTUR CHEMICAL & INDUSTRIAL CORP. L**
**NOW CHEMICALS AND PLASTICS INDIA LTD.**

**Other Products: C.T.C. * CHLOROFORM * METHYLENE CHLORIDE * ETHYL SILICA**
**FUMED SILICA * AROMATIC CHEMICALS**

*AVAILABLE IN BULK QUANTITY, BEST QUALITY MATERIAL AGAINST MODVAT FACILITY*

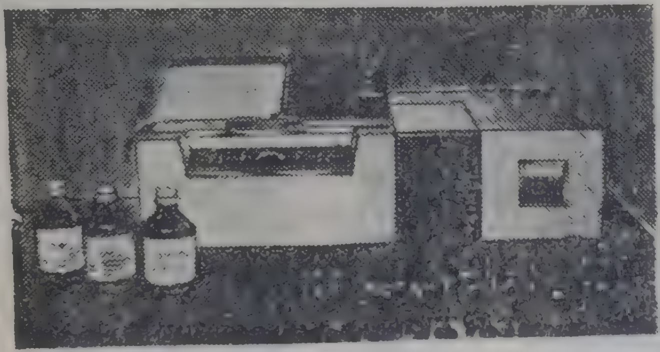
1. **FATTY ACIDS:** Oleic, Recenoleic, and other Fatty Acids.
2. **METALLIC STEARATES & PVC STABILISERS:**
   a) ***SOLID:*** TBLS, DBLS, DBLP, L.S., C.S., Lead Complex Stabiliser LI 615 & 612 for Rigid PVC Pipes & Cables.
   b) ***LIQUID:*** Barium Cadmium Liquid Stabiliser & Chelators.
3. **ORGANO TIN STABILISERS:** Toxic, Non-Toxic
4. **RUBBER CHEMICALS:** Zincomat, Thiuram (TMT), S.P., Z.D.E.C., Mentafor-F, Stickex, Rubber Foam Stabiliser.

CONTACT MANUFACTURERS

**M/s. M.G. CHEMICALS AND OXIDES**
G-42, 'D' Wing, Dewan Apts. No. 2, Navghar, Vasai Road (East), Dist. THANA, Pin: 401 202
**Phone: (02523) 3118 / (02523) 3117**
**OUR BOMBAY OFFICE ADDRESS:**
A-10/3, Indrayudha Hsg. Society, M.G. Road, Goregaon (W), Bombay 400 090. **Phone: C/o. 6722018**

## The lowest %, the highest marks !

# Lowest % absorption gives RANBAXY'S Solvents for Spectroscopy highest marks for accuracy!



Ranbaxy's solvents for spectroscopy give minimum absorbance at specified wavelengths leading to optimum accuracy. Currently available is the following range of solvents:

- ACETONE
- BENZENE
- CARBON TETRACHLORIDE
- CHLOROFORM
- DICHLOROMETHANE
- ETHYL ACETATE
- METHANOL
- iso-PROPANOL

*For your requirements, please con*

**RANBAXY**
LABORATORIES LIMITED

**CHEMICAL DIVISION MARKETING OFFIC**
16 MARINA ARCADE, CONNAUGHT CIRCUS
NEW DELHI - 110 001
Phones : 323738, 323739; Telex : 031 4220
Cable : RANBAXYLAB CONNAUGHT CIRCUS

Put **RANBAXY** Reliability in your Laboratory!

SC
from quality toppers

YOUR PACKING PROBLEM
IS NOW SOLVED

Because Reliance Jerrycans & Ba
are manufactured on most sophistic
automatic Blow-moulding Machin
with rigid quality control and pass
through all kinds of different tests
assure you the best guaranteed
protection to your precious produ

**Relianc**
JERRYCANS & BARRE

Manufactured by:
**RELIANCE PLASTIC**
11-A, Unique Industrial Estate.
Opp. Jawahar Talkies, Mulund (West)
Bombay - 400 080.
Phone: 5619994, 5618131 Res: 5613

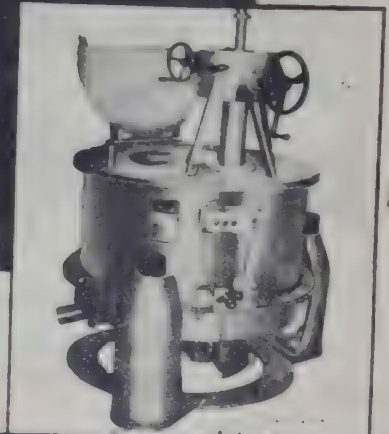
A LEADING NAME IN
CENTRIFUGES

LABORATORY

This model is meant for taking small trial batches in Plant and R&D Laboratories with a very high centrifugal force. Variable speed arrangement is also available

TOP DISCHARGE

Conventional batch type Centrifuges with conventional speeds. Unloading from the top by hand scraping.



VERTICAL PLOUGHING

Keeps manual handling away from hazardous chemicals and saves lot of unloading time and labour. Provided with a Plough, auxilary motor and improved mechanical clutching.

PEW
PARISHRAM

**PARISHRAM ENGINEERING WORKS**
Regd. Office: 113, Marol Co-operative Industrial Estate, Mathuradas Vasanji Road
Near Sakinaka, Bombay-400 059. Phones: 6344787 o Residence: 6124980.
Telex: 011-79293 OPEW IN. Gram: CENPARIKH.

*Available in Bulk Quantity and ready stock*

**FRUSEMIDE I.P./B.P.**

**FENBENDAZOLE**

**C.P. MALEATE**

**DIMETHYL AMINO ETHYL CHLORIDE HCL**

**MEBENDAZOLE U.S.P.-22**

**MEBENDAZOLE U.S.P.-22** (White)

**RIFAMPICIN**

**ALBENDAZOLE**

**FLUBENDAZOLE**

**DIMETRIDAZOLE (VET)** (for export)

WANTED LOCAL AGENTS/STOCKISTS IN UNREPRESENTED AREAS

**TRANSCHEM PVT. LTD.**

56, Ridge Road, Malbar Hill, BOMBAY 400 006.
Phone: 8123636 - 8128608 - 8117511 - 8113334

## MANUFACTURERS OF ACID MILLING DYES

RED RS * RED G * RED GRS * RED 3BN *
PINK R * RED F2R * MAROON V *
NAVYBLUE- S5R * YELLOW 5GN *
YELLOW M * YELLOW N4GN *
GOLDEN YELLOW N2M *
METAL COMPLEX BLACK WA &
DIRECT DYES

**CHROMILL COLOUR INDUSTRIES**

### INTERMEDIATES for DYES Manufacturers

2:5 DICHLORO 1:4 SULFOPHENYL -
3 METHYL 5 PYRAZOLONE *
1:4 SULFOPHENYL 3 METHYL 5 PYROZOLONE *
G-SALT * EBA METASULFONIC ACID. *
PARA AMINO AZO BEZENE SULPHONIC ACID *

**SHIDIMO INTERAUX PVT. LTD.**

Office: 901-902, Adatia Awas, Bombay Market,
Umarwada, SURAT 395 010.
Gram: CHROMILL
Phone: 44438, 43758

Factory: S.No : 245, LAJPORE. 394 235
Via Sachin Dist. Surat.
Phone: 60, 61.

Export Inquiries Solicited.

---

## RUKMA-CHEM Offers

## NONIONICS

BASED ON NONYL PHENOL
OCTYL PHENOL, CASTOR OI
FATTY AMINES ETC.

POLYSORBATES 20, 60, 80,
EMULSIFYING WAX
CETOMAGRAGOL 1000

| | | | |
|---|---|---|---|
| P.E.G. | 200 | P.E.G. | 145 |
| P.E.G. | 300 | P.E.G. | 300 |
| P.E.G. | 400 | P.E.G. | 400 |
| P.E.G. | 600 | P.E.G. | 600 |
| P.E.G. | 1000 | P.E.G. | 800 |

EMULSIFIERS : DEMULSIFIERS
ANTISTATIC OIL : CONING OIL ETC

CALCIUM SALT IN BUTANOL
70% ACTIVE

*Contact Manufacturers*

Rukma

**Rukma-Chem Products P. Ltd**

**Office:** SM Bhavan, Plot No. B-7 & B-10,
Road No. 8 & 15, Wagle Industrial Estate,
Thane 400 604. Maharashtra.
**Tel. No.: 509383/594144/594145**
**Telex: 011-79380 SMIM IN Fax: 31-22-634498**
**Works:** W-89(D), M.I.D.C., Chemical Zone,
Taloja, Panvel, Dist. Raigad.
**Phone: 410 TALOJA**

**If the history of planet Earth can be seen as 1 day, then,**

1) The Human species arrived only 10 minutes ago.
2) Civilization is only 5 seconds old.
3) The Industrial Revolution only 1/8th of a second.
Yet so much has been achieved in 1/8th of a second.

Superchem making the most of 1/7th of 1/8th since we arrived 'only' 30 + years ago;

Process chemicals for the textile industry for Sizing, Desizing, Scouring, Mercerising, Dyeing, Printing and Finishing.

SUPERCHEM®

**SUPERCHEM®**
132, Dr. Annie Besant Road, Bombay-400 018
Phone: 493 6041, 493 38 18, 493 5482.
Grams: 'Thinogum'. Telex: 75643.

a M.G. Saraf Enterprise
Most trusted name in chemicals.

Available From Ready Stock:
IN SMALL PACKINGS OF 450 ML / 5 Lit / 30/35 Lit & 50 Lit/Kg.

Acetone
Amyl Acetate
Acetic Acid Glacial
Aniline Oil
Butyl Alcohol - N
Butyl Acetate
Benzene (N.G.)
Carbitol
Carbon Tetra Chloride
Chloroform/Cellosolve
Cellosolve Acetate
Cyclohexanone
Cyclohexylamine/D.E.P.
Di Acetone Alcohol
Di Butyl Phthalate
Di Octyl Phthalate
Di Ethanolamine
Di Ethylene Glycol
Di Methyl Formamide
Epichlorohydrine
Ether Petroleum (40/60)
Ether Petroleum (60/80)
Ether Petroleum (80/100)
Ether Petroleum (100/120)
Ethyl Acetate
Ethylene Glycol
Ethylene Dichloride
Formaldehyde 37%
Glycerine/Iso Propanol
Hydrazine Hydrate
Liquid Paraffin Light
Liquid Paraffin Heavy
Methyl Ethyl Ketone
Methyl Iso Butyl Ketone
Methylene Chloride
Mono Chloro Benzene
Mono Ethanolamine
Mineral Turpentine
N. Hexane/Octoic Acid
Octyl Alcohol/O.D.C.B.
Oleic Acid Commercial
Oleic Acid Pure
Pine Oil
Perchloro Ethylene
Propylene Glycol
Phosphoric Acid
Poly Glycol 200/400/600/
Potas Hydroxide Pellet
Silicone Oil (All Grades)
Silicone Grease
Sodium Silicate Natural
Solvent Naphtha Heavy
Solvent Naphtha Light
Sorbitol/Styrene Monome
Tertiary Butanol
Trichloroethylene
Toluene (N.G.)
Tri Ethanolamine•
Trichloro Benzene
o-Xylene

Please Contact:

**MEMBA CHEM CORPORATION**

19, M.J. Co-op. Housing Society Ltd., Ground Floor, 187, Shamaldas Gandhi Marg (Princess Street), Bombay 400 002.
**Phone: 316261/252255**

**We are pleased to offer our own**

**TOLUENE**

**(Nitration and Pure Grade)**
**(in barrels or bulk)**

**To actual consumers having all valid licences.**

Kindly write with full details to:

**M/s. SAVIORAY LABORATORIES PVT. LTD.**

Post Box No. 5527,
Dadar, Bombay 400 014.

**Introducing for the first time in India**

Anatto Colours [Natural Colour]
Available food Colours-Tartrazine, Carmoisine
Brilliant Blue FCF, Sunset Yellow FCF.
**Brilliant Blue FCF Special Supra (ISI)**

Fast Green FCF (ISI), CI 42053. Suitable for bright black & brown
Available in Lake Form and Special colours for Capsules and cosmetics.

Also available Alizarine Cyanine Green F, Colour Index No. 6157
Eosine and Acid Yellow 73 (Uranine)

Solicit your Enquiry for Food Colour Mixtures, Pea Green, Black, Chocolate Brown etc. and also for Lake Colours

NECOL

**Neelikon Dyestuffs.**

204, Dr. D.N. Road, National Insurance Bldg.,
First Floor, Bombay 400 001. Tel.: 204 53 22

*Where Quantity & Quality Matter*
*always Count on....*

KC
KRIPA'S

ACID SLURRY

SODIUM LAURYL SULPHATE
(POWDER, NEEDLES & LIQUID)

SODIUM LAURYL ETHOXY SULPHATE

INDUSTRIAL DETERGENT 40%
HOUSE HOLD DETERGENT POWDER
SPRAY DRIED - 25 Kgs. BULK PACKING

KC
KRIPA'S

KRIPA CHEMICALS PVT. LTD.

**Admn. Office:**
8/9/10 'Royal Chambers',
S. No. 47, Paud Rd., PUNE-411 038.
**Phone: 333245, 331825, 331855**
**Telex: 0145-729 KRIPIN**

**Branch Office:**
House No. 1024, 10th Main Road,
West of Chord Road, IIIrd Stage, 1st Block,
Bangalore-560 079 **Phone:** 357393

PRINT-DESIGN

ATTENTION CONSUMERS AND EXPORTERS
AVAILABLE QUALITY PRODUCTS

**2:5 Di Chloro Aniline** (Scarlet GG Base)
**2:5 Di Chloro Nitro Benzene**
**Ortho Chloro Aniline**
**Para Nitro Phenol**
**Sodium Para Nitro Phenol**

Contact Manufacturers:

**GEMCHEM INDUSTRIES**
**MEDICS LABORATORIES**

74, Matru Smruti, Road No. 4, Scheme No. 6, Sion (East), Bombay 400 022.
Phones: 4077431/32/33 * Telex No.: 011-73254 ALAB IN

---

Ethylene Dichloride 250 Kg. HDPE Drum Packing Formaldehyde 220 kg. HDPE Drum Packing
TRIETHANOLAMINE DIETHANOLAMINE MONOETHANOLAMINE
ETHER PETROLEUM 40-60/60-80/80-100/80-120/90-100/100-120 OLEIC ACID TECH

AMYL ACETATE
BUTYL CELLOSOLVE ACETATE
BUTYL CARBITOL ACETATE
CELLOSOLVE ACETATE
MONOCHLORO BENZENE
TRICHLORO BENZENE
PARA DICHLORO BENZENE

CARBITOL ACETATE
ISOPROPYL ACETATE
METHYL ACETATE
OCTYL ACETATE
ORTHO DICHLORO BENZENE
ISO AMYL ALCOHOL

TRIETHLAMINE
DIETHYLAMINE
MONOETHYLAMINE
MONOISOPROPYLAMINE
DIISOPROPYLAMINE
MONOCYCLOHEXYLAMINE
DICYCLOHEXYLAMINE

For INK / VARNISH / PAINTS Mfgs
MALEIC RESIN (Spirit Soluble / Oil Soluble)
POLY VINYL BUTYRAL (P.V.B.)

QUALITY CSC SOLVENTS

**Chemical Solvent Centre**
43, Princess Street, 3, Devkaran Mansion, 1st Floor, Bombay 400 002.
Office: 314293 * 313812 * 254853 Resi: 8114061 * 6301104
Gram: CHESOLVECE * Telex: Aslm 011-73145

---

FOR YOUR REGULAR REQUIREMENTS OF:

**BON ACID**

(Manufactured By : NEWPAR AROMATICS P. LTD.)

Please Contact:

**P.D. SALES CORPORATION**
206/A, Matru-Chhaya, 378/80, Narshi Natha Street, Bombay - 400 009
Phone: Off: 343314, 331864 Res: VIRESH MEHTA 5617576 PRADIP SHAH 5139539

WE ALSO OFFER
* 2:5 Dichloro Aniline (Fast Scarlet GG Base)
* Meta Chloro Aniline
* P.C.A.
* P.N.C.B.

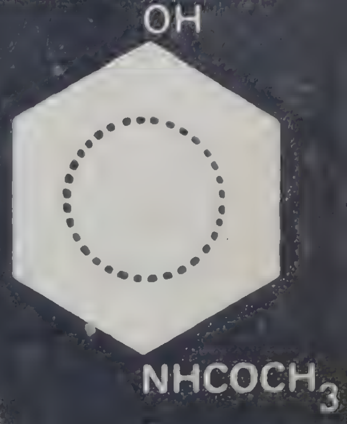
PARACETAMOL

IP/BP

CHEMICAL Formula

Acetaminophen
4′ — Hydroxyacetanilide
P — acetylaminophenol
N — Acetyl p-aminophenol
P — acetaminophenol
P — acetamidophenol

STRUCTURAL Formula



MANUFACTURAL Formula

farmson

THE PERFECT PRODUCT OF

farmson
Pharmaceutical Gujarat Pvt. Ltd.

**Head Office:** Shankar Bhuvan, Sayaji Gunj, Vadodara-390 005. Phones: 327136/327138.
Grams: FARMSON. Telex: 0175-694 KEKE IN
**Works:** 98/1-2-3-4, GIDC Industrial Estate, Nandesari, Dist. Vadodara. Phone: 219.
**Research Centre:** At Nurpura, Post Baska, Tal. Halol, Dist. PANCHMAHALS.

**SALES OFFICES:**
**Bombay:** 404, Embassy Centre, Nariman Point, Bombay 400 021. Phones: 231144, 230383.
Gram: KEKEVII
**Hyderabad:** 1-1-700/B-1, New Bakaram, Hyderabad-500 380. Phone: 65836, Gram: FARMSON.

**Regional Representatives**
- KHOKANI ASSOCIATES, 3rd Floor, Keshav Baug, 116, Princess Street, BOMBAY-400 002. Tele. No. 252244, 252688.
- PAN ASIAN Commercial Corporation, 4, Rabindra Sarani, CALCUTTA-700 001. Tele. No. 277595-475047. Cable: PANASIAN.
- B & I Enterprise, Cama Building, 2nd Floor, 24/26, Dalal Street, BOMBAY-400 023. Tele. No. 271964.
- NEELGIRI AGENCY, B-5, Shivlok House-1, Karampura Comm. Centre, Opp: Milan Cinema, Najafgarh Road, NEW DELHI-110 015. Tele. No.: 5413818.

NIRMAL

The Biggest Manufacturer of India

FOR YOUR REQUIREMENTS OF:

- * Vinyl Sulphone Dyes -- Turquoise Blue G
- * Reactive Turquoise Blue H5G, H7G, H2G
- * Reactive Navy Blue HR
- * Direct Turquoise Blue

FOR EXPORT

*CI BLUE -- 21*
*CI BLUE -- 25*
*CI BLUE -- 59*
*CI BLUE -- 86*

Contact Manufacturers:
**AT BOMBAY OFFICE:**

**BLUESTONE DYE CHEM INDUSTRIES**

**Office:**
77/87, Abhechand Gandhi Marg,
Shreeji Krupa Building,
Room No. 19, 2nd Floor, Bombay 400 003.
**Phones: 342466/324526, C/o. 345512, Resi.: 5610860**

**Factory:**
Shed No. C-1/B-3, G.I.D.C., Vapi,
Dist. Bulsar, Gujarat, Pin 396 195.
**Phone: 837.**
**(Export enquiries also solicited)**

*Associated Concern:* **KUSUM DYE CHEM INDUSTRIES**
Plot No. 303/8/D, G.I.D.C., Vapi District Bulsar, Gujarat Pin. 396 195.

For Your Regular Requirements of:

**Acetonitrile**
**Acetyl chloride**
**Acrylamide * Acrylonitrile**
**Allyl Alcohol**
**Alpha Picoline**
**Butyl Cellosolve * B.H.T.**
**Chloroform * Cyclohexane**
**Di Methyl Formamide**
**Di Methyl Sulphoxide**
**Epichloro Hydrine**
**Ethylene Dichloride**
**Formic Acid -- 99% & 85%**
**Hydroxylamine Hydrochloride**
**Hydroxylamine Sulphate**
**Iso Amyl Alcohol**
**Iso Butyl Alcohol**
**Iso Butyric Acid**
**Iso Propyl Alcohol**
**Lithium Hydroxide**
**Magnesium Oxide**
**Malonic Acid**
**Methyl Cellulose 4000**
**Methyl Cellosolve**
**Methyl Formate**
**Morpholine**
**Methyl Ethyl Ketone**
**N. Butyl Amine * N. Butyric Ac**
**N. Heptane * N. Propyl Amine**
**Quinoline * P.C.B.A.**
**Para formaldehyde 84-85%**
**Perchloro Ethylene**
**Petroleum Ether 40-60%, 60-80%, 60-9**
**Secondary Butanol**
**Sodium Methoxide**
**Soya Lecithin Powder**
**Thiourea**
**Tri-Chloro Ethylene, T.E.G.**
**Tertiary Butyl Alcohol**
**Xanthone * Zinc dust**

**H.P.M.C. 5 CPS, 15CPS, 50CPS, 606 CPS**

Please Contact: **Gurukrupa Chemical Corporation**
Gopal House, 2nd Floor, 7/9, Kumbharwada Cross Lane, Veer Vithaldas Chandan Street, BOMBAY 400 003.
**Phones: 321020/339968/344937**
**Residence: 6124644/6122149**

**For Your Requirements Of:**

**High Purity Laboratory Liquid Reagents Of LR./AR./EL. Grade**

- * ACIDS
- * AMMONIA SOLUTION 0.91/0.88
- * SOLVENTS
- * HYDROFLUORIC ACID 40% & 48%

**& Wide Range of Liquid Reagents etc.**

**Contact Manufacturers:**

BDI **BHARAT DYE-CHEM INDUSTRIES**

**Office:** Mangaldas Building, No 1, Room No 46, 2nd Floor, Mangaldas Road,
Princess Street, Bombay-400 002.
**Works:** W/249 A. M.I.D.C., Rabale Village, Near Pipe Line Road,
Thane Belapur Road, Thana (Maharashtra).
**Tel. Office: 295632, 251213**
**Residence: 5129715, 5133549**
**Works:** (STD 0215) 2807
**Cable: MAITRI-BHAV**

*Connected to one of the oldest industries in the world, which incidentally is also the youngest.*

***From ancient garments made of bark and hide, through historical finds of Chinese silk and Egyptian cotton at burial sites, to modern fabrics made on computerized looms, humankind's relations with clothes are as old as civilization. From the time when lamp-black, powdered lapis lazuli, red ochre, dye secretions of the banded murex snail, indigo and other plant, mineral and animal dyes have been used, human facination with colouring agents is also well known.***
***We at Texchem continue this oddyssey, this quest for cloth and its colour.***

***Process chemicals for the textile industry for Sizing, Desizing, Scouring, Mercerising, Dyeing, Printing and Finishing.***

TEXCHEM®

TEXCHEM®

182, Dr. Annie Besant Road, Bombay-400 018
Phone: 498 6071, 498 88 18, 498 5482.
Grams: 'Thinogum'. Telex: 75648.

a M.G. Saraf Enterprise
Most trusted name in chemicals.

AVAILABLE

* STEARIC ACID (All Grades)
* RICE BRAN DISTILLED FATTY ACID
* GLYCERINE (I.W.)

For Quality, Competitive Prices & Regular Supplies

Contact:

**FOODS FATS & FERTILISERS LTD.**

G.P.O. Box No. 10066, Green House, Green Street, Fort, Bombay 400 023.
Tele: 2862136/2861846

**25 Glorious Years!**

---

For your Requirements of

**EDTA, NTA and their Salts**

Used in Agriculture, Textile, Rayon, Soaps and detergents, Rubber, Paper, Leather, Pharmaceuticals, Electroplating, Photography, Water-Softening, Paints, Plastics, Resins, Cosmetics and Various other Industries as Chelating/Sequestering/Metal Complexing Agents.

please contact manufacturers :-

**CHEMOFINE INDUSTRIES**

138, MADHANI ESTATE, 542, SENAPATI BAPAT MARG,
DADAR (W), BOMBAY: 400 028.
Tel. Office: 4229932. Residence: 4220392.

(Factory at Chembur, Bombay.)

PRINT DESIGN

---

FOR YOUR REQIUREMENTS OF

Ammonia Gas
Ammonia liquor

PURITY 99.5% IN CYLINDERS OF 40 & 50 KGS ROAD TANKERS OF 5, 6, 7 M.T. SPECIFIC GRAVITY 0.910 & O.888 IN ROAD TANKERS, 7-9 M.T. DRUMS, CARBOYS & BOTTLES

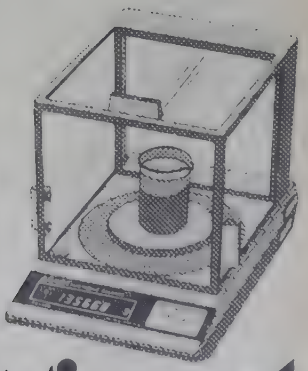
Please Contact: **ASCO CHEMICAL COMPANY**

61, Bombay Talkies Compound, Post Box No. 17629, Malad (West), Bombay 400 064.
**Tel.: Off.: 6820151/6821667/692233; Resi.: 6265775; Gram: "PAGODA" Malad, Bombay 64.**
**Factory:** Plot No. 4, Mira Co-op. Industrial Estate, Mira, Dist. Thane. **Telephone: 663691**
**And Also Available At Ankleshwar (Guj).**

**ANKLESHWAR AMMONIA SUPPLY CO.**

Plot No. 6508, GIDC, Ankleshwar, Gujarat.
**ANKLESHWAR: (M. STD CODE No. 0264622) Tele.: 3010**

"IS YOUR ELECTRONIC BALANCE TURNING YOU INTO A PROFICIENT GAMBLER?"



Because each reading you take is given the benefit of the doubt, or accompanied by a sizeable margin for error? Then maybe it's time you called for an electronic balance that totally eliminates guesswork

**The Afcoset Electronic Balance.** Manufactured at Afcoset's state-of-the-art factory. Where engineers trained at A&D, Japan, design sleek and sophisticated high-precision Electronic Balances using A&D'S faultless technology. To meet your requirements. And the highest international standards

Afcoset Electronic Balances are capable of highly accurate and reliable performance — in the most exacting industrial applications. So you can stop playing guessing games and get down to serious business

Afcoset
BALANCES
Licence A&D Japan

**The Bombay Company Ltd**
334 A-Z Industrial Estate
[illegible] Marg [illegible]
Tel 4944384/4938218/19 Tlx 011 [illegible]

AFCOSET ELECTRONIC BALANCES. PRECISION AT YOUR FINGERTIPS.

For Quality And Quantity

**Mono Chloro Benzene (M.C.B.)**
**Para Di Chloro Benzene (P.D.C.B.)**
**Ortho Di Chloro Benzene (O.D.C.B.)**
**Tri Chloro Benzene (T.C.B.)**

Contact Manufacturers:

**CHEMIEORGANIC**

G-6, Everest, Tardeo, Bombay 400 034.
**Phones: 4949468/494195. Gram: SYNTHORGAN, Bombay-34. Telex: 011-76297 BABA IN**

---

AVAILABLE BEST QUALITY WITH EXCISE MODVAT FACILITIES

**LACTIC ACID (SPAIN)**
**SODIUM LACTATE SOLN. 60% & 70% w/w**

SODIUM CITRATE I.P.
DISODIUM HYDROGEN CITRATE B.P.
POTASSIUM CITRATE I.P.
SODIUM ACID PHOSPHATE I.P.
SODIUM CITRATE ANHYDROUS
NICKEL SULPHATE
NICKEL NITRATE

DIPOTASSIUM HYDROGEN CITRATE
CITRIC ACID ANHYDROUS
TRICHOLINE CITRATE SOLN. 65% w/w
IRON CHOLINE CITRATE SOLN. 66% w/w
CHOLINE DIHYDROGEN CITRATE SOLN. 50% w/w
COBALT SULPHATE
AMMONIUM MOLYBDATE

Manufactured by:

**M/s. SUNIL CHEMICALS**

*ADMN. OFFICE:*
*63, Shamaldas Gandhi Marg,*
*Devkaran Mansion,*
*1st Floor, Bombay 400 002.*

*FACTO*
*Parekh Industrial Esta*
*Chandansar Road, Virar (Eas*
*Dist.Thane (M.*

**Phones: (Bombay) 2864003. 2864086, 2864226. Residence: 6230699**

---

**We Offer Best Quality And Competitive Rates**

**AMMONIUM THIOCYANATE**
**POTASSIUM THIOCYANATE**
**SODIUM THIOCYANATE**
**ETHYLENE THIO-UREA**
**ZINC CARBONATE**
**ACETAMIDE**

Please Contact Manufacturers:

**M/s. PARAS CHEMICALS**

A-2/4, G.I.D.C. Vapi, Gujarat. Bombay Res. Tel. No. 6493549 Bombay Telex: 011 79303 FC IN

Quotations are invited for the following items, within one month of the publishing of this advertisement, indicating F.O.R. Prices, firm delivery period, pack size and other terms/conditions for supply:

| Sl. No. | Item | Annual requirement (in tons) | Sl. No. | Item | Annual requirement- (in tons) |
|---|---|---|---|---|---|
| 1. | Acetamide | 100.00 | 19. | Sulphosalicylic Acid | 12.00 |
| 2. | Acetone (in tankers) | 400.00 | 20. | Para Toluene Sulphonic Acid | 80.00 |
| 3. | Ethyl Bromide | 50.00 | 21. | Sodium Nitrite | 40.00 |
| 4. | Ethyl Acetate | 60.00 | 22. | Aluminium Chloride | 60.00 |
| 5. | Methanol (in tankers) | 250.00 | 23. | Acetic Anhydride | 30.00 |
| 6. | Acetic Acid Glacial | 150.00 | 24. | Triethylamine | 70.00 |
| 7. | Copper Sulphate LR | 60.00 | 25. | Beta Naphthol | 12.00 |
| 8. | Sodium Bisulphite | 40.00 | 26. | Iso Propyl Alcohol (in tankers) | 200.00 |
| 9. | Acetyl Chloride | 25.00 | 27. | Potassium Carbonate | 120.00 |
| 10. | Anhydrous Ammonia | 180.00 | 28. | Potassium Hydroxide | 60.00 |
| 11. | Phosphoric Acid | 60.00 | 29. | Phosphorus Oxychloride | 15.00 |
| 12. | Caustic Soda Flakes | 250.00 | 30. | Benzene (in tankers) | 250.00 |
| 13. | Sulphuric Acid (in tankers) | 600.00 | 31. | Monomethylamine Aqueous 40% | 60.00 |
| 14. | Dimethyl Sulphate | 50.00 | 32. | Chlororom | 120.00 |
| 15. | Dimethylamine HCl | 50.00 | 33. | Formaldehyde | 60.00 |
| 16. | Activated Carbon | 50.00 | 34. | Potassium Fluoride | 25.00 |
| 17. | Carbondisulphide (in tankers) | 100.00 | 35. | Rani Nickel | 6.00 |
| 18. | Cyclohexane | 15.00 | 36. | Hexane Commercial | 40.00 |
|  |  |  | 37. | Thionyl Chloride | 12.00 |

Specifications can be obtained from the undersigned on any working day between 10 a.m. to 4.00 p.m. either in person or by writing to:

**Materials Manager**
**RANBAXY LABORATORIES LIMITED**
A-11, Phase - III
Industrial Estate,
S.A.S. Nagar (PUNJAB) - 160 055.

**For Your Small & Bulk Requirements Of:**

**Morpholine * Phosphorous Trichloride * Tributyl Phosphate**
**Phosphorous pentoxide * Phosphorous Oxychloride**
**Mono Ethanolamine * Tri Ethanolamine * Diethanolamine**

PLEASE CONTACT:
**S.I. CHEMICALS & TRADING CO. PVT. LTD.**
65, Bombay Samachar Marg, Sonawala Building, 2nd Floor, Bombay - 400 023
Phone : 286 34 18, 286 12 36. Cable "SICORPOBOM" Telex : 11-5028 CHEM - IN

---

**AMMONIA** Gas / Liquor

Gas:
Purity-99.5%
In Cylinders of 40 kg./50 kg.
In Tankers of 500 kg.
In Road Tankers of 5, 6, 6.5 M.T

Liquor:
Sp. Gravity 0.910 & 0.888.
In Road Tankers, Drums & Carboys

Please Contact:
***JAYSONS CHEMICAL INDUSTRIES***
SAKI VIHAR LAKE ROAD, POST BOX NO. 8968, SAKINAKA, BOMBAY - 400 072
**Phones: 582704/589205/589208**
**Grams: JAYSONS--Bombay-400 072**

**BRANCHES**

261, Kandla Kashan Street,
Delhi-110 006
**Phone: 235516**
**Gram: 'JAYCI'**

Plot No. 317/7, G.I.D.C.,
Vapi, Dist. Bulsar-396 195
**Phone: 1689**

18-A, Mai Krupa Society,
Old Channai, Highway Road,
Baroda
**Phone: 22161**

---

**H-ACID**

**OF INTERNATIONAL STANDARD**
**FROM**

**SHREE HARI CHEMICALS (INDIA) PVT. LTD.**

CATERING TO THE NEEDS OF DOMESTIC & EXPORT MARKETS EFFICIENTLY

**Bombay Office:** Amrit Niwas, 3rd Floor, 159/2, Cavel Cross Lane No. 6,
Kalbadevi, Bombay 400 002.
**Phones: 292081/258697 Telex: 011-5394 ANUJ IN (SHC)**
**Works:** A/8, M.I.D.C., Mahad, Distt. Raigad.
**Phone: 2711/2713**

**Available Regularly Ex-Stock/Ex-Factory**

SODIUM HYDROXIDE PELLETS Pharma (BP/IP Specification Passes)/
LR/AR/GR Grades
POTASSIUM HYDROXIDE PELLETS Pharma/LR/AR Grades
GUANIDINE NITRATE Extra Pure Grade 98-99%
SUCCINIC ACID Extra Pure 99%
SUCCINIC ACID AR/LR
SODIUM SUCCINATE EP
CALCIUM SUCCINATE EP
SUCCINIC ANHYDRIDE EP

**Manufactured by: "CALIRON" Group of Industries**

M/s. CALIRON CHEMICALS
M/s. CALIRON ORGANICS
M/s. CALIRON SYNTH-CHEM (P) LTD.
P.O. Box No. 184, LUDHIANA - 141 008.

PLEASE CONTACT SELLING AGENT/BOOKING AGENT/AUTHORISED STOCKIST:

**indenta Chemicals (INDIA)**
PRIVATE LIMITED

201, Adamji Building, 2nd Floor,
Syed Mukri Street, Katha Bazar,
Bombay 400 009.
**Cable: INDUMADI, BOMBAY-9.**
**Tel.: 343875/349820/330324.**
**Telex: 011-73098 INDU IN.**
**Tele Fax: FAX: (91)-22 4941163.**
**Attn: M/s. Indenta -- Menon.**

**For Safe Handling of Your Chemicals**

**USE**

**"ZENITH" CARBOYS & JERRY CANS**

ROYAL
ZENITH
ZENITH

*Manufacturers of*

**Quality Blow Moulded Containers**

having range from
20 lit. to 100 lit. capacity
(in Narrow mouth/Wide mouth)

CONTACT MANUFACTURERS

**ZENITH CARBOYS**

32, Unique Ind. Estate, Opp. Jawahar Talkies, Mulund (W), Bombay - 400 080
**Tel.: 5600309, 5618526, 5605599**

**ALWAYS AVAILABLE**

HYFLOSUPERCELL
DICALITE
CITRIC ACID
PECTIN

MELAMINE
PHENOL
PARAFORMALDEHYDE
BUTYL ACRYLATE

LITHOPONE
HYDROGEN PEROX
FORMIC ACID
TARTARIC ACID

Phone:
Resi: 6442063
Office: 345506/347879

Please Contact:
**B.I. MEHTA**

Telex No.
C/o. 11-75617 MMCB
Fax: 00-91-22 325620
Attn.: B.I. Mehta

2-B, Ganga Vihar, 99, Kazi Sayed Street, Bombay 400 003

**WE ALSO BUY/SELL REP-EXPORT HOUSE LICENCE**

---

We Offer A Best Quality at a Very Competitive Rates
For your Small & Bulk Requirements Of:

**Phosphorous Tri Chloride ($PCl_3$)**
**Phosphorous Oxy Chloride ($POCl_3$)**
**Phosphorous Pentoxide ($P_2O_5$)**
**Tri Ethyl Phosphate (TEP)**
**Tri Chloro Molybdenum Phosphide (TCMP)**

Please Contact Manufacturers:

**SANDHYA DYES & CHEMICALS**

**Regd. Office & Works**
Plot No. 1703, G.I.D.C. Sangam,
Sangam 396 155, Bulsar, Gujarat
**Phone: 149 (Bhilad Exchange)**

Bombay Sales Office
5/7, Modern Villa Building
7th Road, Santacruz (East), Bombay 400 055
Phone: 6146516

---

FOR YOUR REQUIREMENTS OF:

FURAZOLIDONE BP
SODIUM SACCHARINE IMP.
INDOMETHACIN BP/USP
LACTIC ACID BP/USP (IMP)
PROPIONIC ANHYDRIDE
DIMETHYL ACETAMIDE
DIMETHYL CARBONATE
2,6-LUTIDINE
DIMETHYL DICHLOROSILANE
DIETHYL CARBONATE
B-HYDROXY ETHYL HYDRAZINE
L-LYSINE HCL (Pharma)

5-NITRO-2-FURFURALDEHYDE
DIACETATE
PIVALOYL CHLORIDE
GUM ROSIN
AMINOPHYLLINE
EPHEDRINE HCL
HYDRAZINE HYDRATE
HYDROXYLAMINE HCL
MAGNESIUM CARBONATE IP
PYRIDINE HYDROBROMIDE
BIS-TRIMETHYL SYLYL UREA
ETHYL CHLOROFORMATE

2-ETHYL HEXOIC ACID
5-SULPHO SALICYLIC ACID
TRIPHENYL PHOSPHINE

PHOTOGRAPHIC GRADE

SODIUM THIOSULPHATE (EX)
SODIUM CARBONATE (EX)
POTASSIUM META BISULPHITE
SODIUM SULPHITE
SODIUM METABISULPHITE
HYDROQUINONE

CONTACT:

**M/s. KIRAN CHEMICALS**

178, Sant Tukaram Road, 1st Floor, BOMBAY 400 009.
Phone: 8512053/8517313/8728929
Resi: 4076078/4078231/4077254/4075799

f you DON'T want to STARVE TOMORROW
CONSERVE TODAY
UniOil

UNIQUE OILS INDIA LTD
CAN SHOW YOU THE WAY

Their State-of-the-art drum reconditioning plant at Tarapur can bring back your old drums to AS NEW condition and give new lease of life to them. The process is cost-effective too. A large number of users of drums are reaping the benefits WHY NOT YOU???

Their sophisticated used oil re-refining plant can purchase all your used lubricating oil for scientific re-refining. Give your used oil to them and prevent its use for spurious purposes Contribute towards saving country's foreign exchange

Contact:
**Unique Oils India Limited**
Regd Office Arvind Chambers 2nd Floor (Gouri Studio Comp.).
194 Andheri-Kurla Road Andheri (E) Bombay-400 069
Tel 6347210 [illegible] Telex 011-79292 UOIL IN • Fax 009122-636 4654
Factory. Plot M-4, MIDC Industrial Estate
Tarapur, Dist. Thane, Maharashtra, Telex: 0132-236 UOIL IN Tel: 2892

---

FOR YOUR REQUIREMENTS OF

- * PARA TOLUENE SULPHONYL CHLORIDE
- * PARA TOLUENE SULPHONAMIDE
- * PARA TOLUENE SULPHONYL UREA
- * PARA TOLUENE SULPHONIC ACID
- * PARA CHLOROBENZENE SULPHONAMIDE
- * PARA CHLOROBENZENE SULPHONYL UREA
- * RANSOLITE (SULPHONAMIDE RESIN)

Please Contact:

MANUFACTURER:
**M/s. USHMA INDUSTRIES**
124/36A, G.I.D.C.
Nandesari 391 340, Dist. Baroda,
Gujarat State
**Phones: 320761, 320645**
**Resi: 21396, 22194.**
**Fax: 0265-320929. Telex: 0175-401 HEMA IN.**

BOMBAY DEALER:
**PARUL TRADING CO.**
Room No. 10, 1st Floor,
310-314, Samuel Street,
Bombay - 400 003.
**Phones: 337738, 327105**
Office Time: 1.00 p.m. to 6.00 p.m.

CALCUTTA OFFICE:
MR. GAUTAM B. PATEL.
**RECKON REMEDIES**
23/3A, Convent Road, 4th Floor, Calcutta 700 014 Phone: 249587; Resi: 469164

FOR YOUR REGULAR REQUIREMENTS OF:

**SODIUM DICHROMATE**

(Manufactured By: KONARK CHROME CHEMICALS PVT. LTD.)

Please Contact:

**BHANWARLAL JHANWAR & SONS**

201/203, NARSI NATHA STREET, ROOM NO. 9, 3RD FLOOR, BOMBAY 400 009.
Phone: 8555289 - 863114 * Resi: 6735464

WE ALSO OFFER

**HYDRAZINE HYDRATE 80% - MORPHOLINE - CYCLOHEXYLAMINE**

INTRODUCING

**LIQUID $SO_3$**

**OLEUM 65%, OLEUM 23/25% & SULPHURIC ACID 98%**
**SULPHURIC ACID BATTERY GRADE (Concentrated)**

PLEASE CONTACT THE MANUFACTURERS

**GOPALANAND RASAYAN**

(A Division of the Indian Link Chain Mfg. Ltd.)

We ensure

- REGULAR SUPPLIES ON LONG TERM BASIS
- MEETING WITH ALL I.S.I. SPECIFICATIONS
- PROMPT DELIVERY AS PER YOUR SCHEDULE

**Registered Office:**
Lal Bahadur Shastri Marg,
Bhandup (West),
Bombay 400 078.
Tel. No.: 582311/586803

**Marketing Division:**
59, Sonawala Building, 2nd Flr.,
Bombay Samachar Marg,
Bombay 400 023.
Tel. No.: 256519/317387

**Factory:**
Plot No. D 18,
M.I.D.C. Boisar,
Tarapur 401 506. Dist. Thane
Tel. No.: 2421/2422

For Pharmaceutical Industries

PETROLEUM BENZINE (PETROLEUM ETHER) 40°-60°/60°-80°/60°-95°
HEXANE 65°-70° EMULSIFYING WAX

* *

For Paint/Pesticide/Agro/Rubber Industries

PETROLEUM BENZINE (PETROLEUM ETHER) 80°-100°/80°-120°/90°-100°/100°-120°

* *

AMYL BUTYRATE ETHYL BUTYRATE BUTYL BUTYRATE
SCHAEFFER'S ACID (AS SODIUM SALT) (Export Enquiries Solicited)

Contact Manufacturers

**STERLING ORGO & INORGO CHEMICALS P. LTD.**

Regd. Office: 340/42, Samuel Street, Raut Chamber, 4th Floor, Bombay 400 003.
Phones: 333601/333602/338722 Telex: ASIM IN 73145 Fax: 331738
Factory: Plot AF-1, Cama Industrial Estate, Walbhat Road, Goregaon (East), Bombay 400 063.
Phone: 6730458/6734593/6734650 Resi.: 352625/364354/8114061

Please Contact For Prompt Supplies Of:

ANHYDROUS
AMMONIA GAS

IN 5/7/9 TONNES CAPACITY ROAD TANKERS AND IN 40/50/60 Kgs. CAPACITY CYLINDERS
ALSO AVAILABLE LIQUOR AMMONIA

**AMMONIA SUPPLY CO. (Bombay)**
22-B, Bombay Samachar Marg, Above George Restaurant, 2nd Floor, Fort, Bombay 400 023.
**Phones: Office: 271914, 272245 & 274526 Residence: 6239566 Godown: 4307473 & 4300205**

**AMMONIA MARKETING CO. (BOMBAY)**
125, III Phase, Peenya Industrial Area, Bangalore 560 058. **Telephones: 394402, 394379**

**ASCO ENGINEERING CO.**
Sodagar Ice Factory Compound, University Road, Baroda 390 002. **Telephones: 328603, 328239**
Plot No. 2926, Phase-I, G.I.D.C., Vapi 396 195

**AMMONIA SUPPLY CO. * ASCO ENGINEERING CO.**
18, New Colony, Model Basti (Near Filmistan Cinema) New Delhi 110 005. **Phones: 776142, 779644**

*Also Available*

NEW CYLINDERS FOR AMMONIA & CHLORINE
DULY APPROVED BY C.C.E. NAGPUR AND CERTIFIED BY B.I.S. NEW DELHI
BRANCHES AND ASSOCIATES ALL OVER INDIA

ETHANOLAMINES
(Pioneer Manufacturers in India)

MONO-ETHANOLAMINE
DI-ETHANOLAMINE
TRI-ETHANOLAMINE

TRI-ETHANOLAMINE LAURYL SULPHATE
COCO-MONO-ETHANOLAMIDE
COCO-DI-ETHANOLAMIDE
DI-ETHYLENE GLYCOL (DEG)

**P.K. VELU & CO. (PTE) LTD.**
111. Mahatma Gandhi Road, Bombay 400 001.
**Tel. 274123 / 5557161 * Telex: 11-82528 VELU IN**

Available Regularly at Competitive Rates Ex-Stock/Ex-Factory

**SODIUM NITRITE * SODIUM NITRATE**

Mfrd. by: M/s. SONIL Div. of M/s. CHEMCROWN (INDIA) LTD.

| | |
|---|---|
| RIFAMPICIN I.P. (COMPACTED) | 2-AMINO-4,6-DICHLORO PHENOL HCL (ACPH |
| IBUPROFEN I.P. | 2-AMINO-4-CHLORO PHENOL |
| PHENOBARBITONE I.P. | OCTYL ACETATE |

Mfrd. by: M/s. CUREKRAFT CHEMICALS (I) PVT. LTD. Divn. of M/s. CHEMCROWN (I) LTD.

**PARA TERTIARY BUTYL PHENOL -- PTBP**

**DITERTIARY BUTYL PARA CRESOL -- DBPC (BHT)**

Indenting Agent of M/s. Balmer Lawrie & Co.

Please Contact:

**CHEMCROWN INDIA LTD.**

D/3, Poonam Apartments, Dr. A.B. Road, Worli, Bombay 400 018.
Phone: 4928386/4928737 * Telex: 011-71758 CHEM IN

CALCUTTA OFFICE: 295652/290218 * DELHI OFFICE: 3317051/3316666 * KANPUR OFFICE: 211641/211825 * MIRZAPUR OFFICE: 35

**SPECIALITY CHEMICALS**

* Ethylene Oxide Condensate
* Propylene Oxide Condensates And Co-polymers
* SLES, TEALS, Cocodiethanolamide
* Synthetic Lubricants for high temperature service
* Industrial Liquid Detergents
* Tailor-made Spin Finish Oils and Coning Oils for Synthetic Fibre/Yarn
* Speciality Chemicals tailor-made to Customer's requirements

**UNITED PESTICHEM & NONIONICS PVT. LTD.**

"AHURA", 84 Sion Road, Sion East, Bombay 400 022.
Phone Nos.: 4074295/96; 4073355; 4091752

Are you Quality Conscious?

**USE BRILEX ACTIVATED CARBON**

A trusted name in Quality for over two decades. Grades equivalent to International Standards as per NORIT, DEGUSSA, TAKEDA and MERCK or as per your specification both powder and granules.

Please Contact

**SUNEETA CHEMICALS**

33, Satnam Bldg., Opp. World Trade Centre, Cuffe Parade, Bombay 400 005
Tel: 216728/213835 Gram: BRILCHEM

FLUORINE BASED CHEMICALS
Manufactured with SWISS/GERMAN Knowhow
Available Ex-stock

SODIUM ALUMINIUM FLUORIDE (CRYOLITE)
AMMONIUM BIFLUORIDE
FLUOBORIC ACID
POTASSIUM BIFLUORIDE
POTASSIUM FLUORIDE
SODIUM SILICO FLUORIDE
SODIUM MONOFLUORO PHOSPHATE
SODIUM BIFLUORIDE
SODIUM FLUORIDE
COPPER, LEAD, TIN FLUOBORATES
HF ACID (ELEC. GR)
HF ACID (ANHYDROUS)
HF ACID (40%, 60%, 70%)

Can also manufacture any other special Fluorine Chemicals to your specification.
Please Contact Manufacturers:

TAMILNADU FLUORINE AND ALLIED CHEMICALS LTD.

*Regd. Office:*
No. 5-C, II Street, Dr. Radhakrishnan Road,
Mylapore, Madras 600 004.
**Tel.: 846138, 846071. Tlx.: 041-6463 TFAC-IN**

*Works:*
Plot No. 14, SIPCOT Industrial Complex,
Cuddalore 607 003, Tamil Nadu.
**Tel.: 2321, 2121. Tlx.: 0462-204 TFCL-IN**

AGENTS

**M/s. HINDUSTAN CHEMICAL CO.**
77B, Juhu Supreme Centre, Gulmohar Road,
Bombay-400 049
**Tel.: 6205464, 6204121**

**M/s. RANA DYES CORPORATION,**
Sringeri Mutt Complex, 1st Floor,
K.V. Temple Street, Sultanpet,
Bangalore 560 053. **Tel.: 77417**

**M/s. RAM-NATH & CO.**
123, Angappa Naick Street, Madras 600 001.
**Tel.: 580623, 585843, 837773, 431006.**
**Tlx.: 041-7399 RANA IN**

**M/s. DECCAN ORGANICS,**
1-8-158/160, Plot. 10, P.B. No. 1503
Prenderghast Road, Secunderabad 500 003
**Tel.: 844857, 840729. Tlx.: 0425-6535**

ATTENTION MANUFACTURERS OF DYESTUFFS, DYE INTERMEDIATES, BULK DRUGS AND BULK DRUG INTERMEDIATES

Regularly Available on Competitive terms

ACETANILIDE
OF ULTRA PURE QUALITY

INTRODUCING SHORTLY

ANILINE OIL
N,METHYL,N,HYDROXY ETHYL ANILINE
OXYETHYL NITRO ANILINE
N,N,DIHYDROXY ETHYL META TOLUDENE
N,ETHYL-N-HYDROXY ETHYL ANILINE
N,N,DIHYDROXY ETHYL ANILINE
N,N,DIHYDROXY ETHYL META CHLORO ANILINE

Contact Manufacturers

VASUDHA CHEMICALS PVT. LTD.
501, Sai Ashish A-Wing, Balrajeshwar Road, Mulund (W), Bombay 400 080.
Tel: 5604382/5613921
Fax: 91-22-5603680
Tlx: 011-71030 DELT IN

*Readily Available*

*DI-ETHYL OXALATE*

Contact Manufacturers:

**ORTHO ESTERS**

General Assurance Building, 232, D.N. Road, 3rd Floor, Fort, BOMBAY 400 001.
**Telephone No. 204 5154 and 204 2398**

**Also Offering**

**"PDI" - ACRON PIGMENTS/BINDER/PIDIVYLS/PIDINONS**
*** DYFINISH KVS * DYZOL TF * TEXTILE CHEMICALS / AUXILIARIES**
*** ACETIC ACID GLACIAL 98/99% * 'NPL' HYDROGEN PEROXIDE 50%**

---

INTERESTING NEWS FOR SSI MANUFACTURERS

ARE YOU KEEN TO EXPORT YOUR QUALITY PRODUCTS REGULARLY?

CONTACT US TO GET SECURE CHANNEL OF REGULAR OVERSEAS BUYERS FOR YOUR QUALITY PRODU
FOLLOWING ARE LINES OF PERMANENT INTEREST TO US.
WE CAN ALSO ARRANGE FOR IMPORTS FROM CHINA, JAPAN, U.S.A. & U.K.

- CHEMICALS — HEAVY & LIGHT
- DYESTUFFS & INTERMEDIATES
- PHARMACEUTICALS
- HANDLOOM, POWERLOOM & HANDICRAFTS
- TEXTILES & GARMENTS
- GEM & JEWELLERY
- FRESH & CANNED FRUITS
- FRESH VEGETABLES
- SPICES

**SINCE 30 YEARS IN THE SERVICE OF CHEMICAL INDUSTRY WINNING PERFORMANCE AWARDS**

*RUSH YOUR OFFERS TO.*

**UNION IMPEX**
151-B, MITTAL COURT,
NARIMAN POINT,
BOMBAY - 400 021.
P.B. NO. 11539
PHONES: 24 22 80 (DIRECT); 22 32 22.
GRAM: UNIONACID
TLX: 11-5290 UNIN IN
FAX: 91-22-6493273

Attn.: Dilip Dwivedi, UNION IMPI

---

FOR YOUR BULK REQUIREMENTS OF:

**Naphthol ASG**
**T.R.O. (Turkey Red Oil)**
**Sodium Lauryl Sulfate**
**Sodium Lauryl Ether Sulfate**
**Triethanolamine Lauryl Sulfate**
**TEBA (Phase Transfer Catalyst)**

Please Contact Manufacturers:

**SWAPNA CHEMIE**

25/160, D.N. Road, Fort, Bombay 400 001.
**Telephone: 2047713**

OTHER PRODUCTS OFFERED: TRIACETIN, CABS, MOLINEX COMPUTERS AND MEDIA PRODUCTS

# REASONABLE PRICES AND EX-STOCKS

## EDTA ACID 99 ± 1%

## LIQUID EDTA (50 C.V. & 100 C.V.)

## DTPA 99 ± 1%

## DTPA SOLUTION 40%

## NITRILO TRI ACETIC ACID (N.T.A.)

CONTACT
MANUFACTURER

**OM NEELKANTH
CHEMICALS INDIA PVT. LTD.**
FACTORY :
S. NO. 204, KARANNAGAR - 382 727
DIST. MEHSANA (N.G.) PHONE : 2129
(KADI - DIRECT DIAL CODE 02769)

OM NEELKANTH
CHEMICALS

OUR NEW HEAD OFFICE ADDRESS :

5, ANAND CHAMBERS, 2ND FLOOR,
NEAR STATE BANK OF INDIA, OPP. "SHILP",
NAVRANGPURA, AHMEDABAD - 380 009.
PHONE : 408360 GRAM : NEELCHEM
TELEX : 121-6539 TRCE IN
ATTN : OM NEELKANTH

We guard your Valuable Property...
... by strong walls of protection.

An outcome of the thorough study of the needs of industrial storage and packaging, by our team of experts, now JYOTI INDUSTRIES launches its new DRUM DIVISION.

**JYOTI
Industries**
(drum division)
**Manufacturers of blow moulded H.D.P.E.
containers upto 100 litres.
JERRY CANS, CARBOYS, DRUMS**
**OFFICE:** 34, Unique Industrial Estate (New), R.P. Road
Opp. Jawahar Cinema, Mulund (W), Bombay-400 080
**Phone: 561 57 68, 560 29 68**
**WORKS:** Poona — Bombay Road, Opp. Amrut Nagar, MUMBRA-400 612 (THANE)

# SCHERING

## TIN INTERMEDIATES FOR TIN STABILIZERS

DBTO : Di-n-butyl tin oxide
DOTO : Di-n-octyl tin oxide
MBTO : Mono-n-butyl tin oxide
MOTO : Mono-n-octyl tin oxide
TBT : Tetra-n-butyl tin
TOT : Tetra-n-octyl tin
TBTO : Tri-n-butyl tin oxide

Contact:

CHIKA

**CHIKA LIMITED**
Bhupati Chambers, 13, Mathew Road, Bombay 400 004.
Phones: 8113456/1457 Cable: "DYECOLD" Telex: 11 75562 and 11 75534
**Branches**
**AHMEDABAD:** Ashram Road, **CALCUTTA:** 36, Ganesh Chandra Avenue
**MADRAS:** 122, Mount Road, **NEW DELHI:** 25/1, Asaf Ali Road

# Chemical Weekly

VOL. XXXV

AUGUST 7, 1990

NO. 48

## CONTENTS

Heralding the 21st Century: Power from ocean waves — T.P.S. RAJAN 41
Chemarena — S.L. VENKITESWARAN 43

### IN THE NEWS

Manufacture of titanium dioxide: TOMCO working on alternate sites 46
IPCL acquires knowhow for AO 48
RIL to raise more funds for cracker project 49
Allocation of caprolactam: 'GSFC favouring Gujarat Nylons' 50

### PHARMACEUTICAL CAPSULE

Hoechst, Burroughs Wellcome challenge demand notices 52
Govt. only reviewing drug policy 53
Drug bandh postponed 53
Package to revive sick drug units on cards 54
Drug industry: Pragmatic policy to be followed 58

### FERTILISER BRIEFINGS

GSFC poised for balanced growth 60a
SPIC allowed to participate in Jordan plant 60c

### MEETINGS AND CONFERENCES

International seminar on chemicals & pharmaceuticals 61
CECRI celebrates Foundation Day 67
CECRI Foundation Day Lecture: Science and Engineering of Electrochemical Processes 68

### ENVIRONMENT NEWS

Bhopal gas tragedy: Govt. argues for rejecting settlement, retaining amount 73
Scientists ignorant of environmental hazards 74

### OIL AND NATURAL GAS SCENARIO

Rs. 2,000 crore Bombay High project awaits PIB nod 75
Plea to review LPG policy 76
Govt. firm on foreign participation: Fourth round bidding for oil exploration soon 78
ONGC may hire OSVs at global market rate 81
Oil and gas sector: Middlemen to be kept out of deals 82
Panel on petrol strategy set up 82

### MINERALS AND METALLURGICAL FRONT

MMTC will import pig iron, tin 83

### ECONOMIC NEWS

Checking underinvoicing of imports India seeks change in Gatt valuation code 84
40 pc fall in foreign tie-ups in 1989 85
Apex body for quality urged 86
Foreign-aided projects: Machinery import under OGL 86

### REGULAR FEATURES

Spotlight on Biotechnology and Life Sciences 89
Food & Pharmaceutical Technology in Perspective 93
Science Briefs 97
New Products 101
Indian Standards 105

### SPECIAL ARTICLE

Chemical Plant Developments — JAMES LOCK 108

### INTERNATIONAL SPECTRUM

Technological Scene Abroad 113
Biotechnology 115
News about New Projects 116
News from Japan 118

### MARKET INFORMATION

Bombay Chemicals Market 125
Bombay Dyes Market 130
Delhi Market 132
Madras Market 133
International Bulk Chemical Prices 134
Shipping News 134
Materials Imported/Exported 137

*Publishers:*
**SEVAK PUBLICATIONS**

*Editor - Publisher*
**R. RAGHAVAN**

*Advertisement Manager*
**N.R. RAJAGOPALAN**

*Administration/Circulation*
**VIJAY RAGHAVAN**

*Editorial & Administrative Office:*
306, Shri Hanuman Industrial Estate
G.D. Ambekar Road, Wadala,
BOMBAY 400 031.
Phones: 4120743/4131198.
Telex: 011-76053 CWLY IN

*Madras Office:*
Room No. 9, Wellingdon Estate,
3rd Floor, 24, Commander-in-Chief
Road, Madras 600 105.
Phone: C/o. 471659.
Telex: 041-6290 CWLY IN.

*Printed at:*
Sevak Publications,
25, North Mada St., Thiruvanmiyur,
Madras 600 041.

Fast Print Service,
307/308, Shri Hanuman Indl. Estate,
G.D. Ambekar Road, Wadala,
Bombay 400 031.

**Subscription Rates:**
**(Inclusive of Postage)**
India: Rs. 400.00
Foreign: US$ 175.00 (Air Mail)
US$ 75.00 (Sea Mail)

***Subscription charges payable in advance in favour of SEVAK PUBLICATIONS***

Now Freely Available

CAUSTIC POTASH FLAKES
CAUSTIC SODA FLAKES/LYE
CHLORO SULPHONIC ACID

Manufactured by
The Andhra Sugars Ltd.

HYDRAZINE HYDRATE All Grades

Manufactured by
The Andhra Farm Chemicals Corpn. Ltd.

श्री SHREE ENTERPRISES
(CHEMICALS) PVT. LTD.

A Shree Group

801, Dalamal Towers, 211, Nariman Point, BOMBAY-400 021.
PHONES: 231336 □ 231308 GRAM: "ANHYDRIDE" TELEX: 011-5179

CHEMICAL
WEEKLY

VOL. XXXV AUGUST 7, 1990 NO. 48

## HERALDING THE 21st CENTURY - 62

# Power from the Ocean Waves

Anyone who knows the sea has a sense of the power of ocean waves. As we all know, waves are powerful enough to move large ships and wreck damage in harbours and on coastlines. Indeed, the total power of waves breaking against the world's coast-lines is estimated to be between $10^{12}$ and $10^{13}$ watts — the equivalent of the global consumption of energy. The energy in ocean waves comes from the wind. The ultimate source is solar radiation, which powers the wind by differentially heating the atmosphere. Like solar energy and the wind itself, wave energy is widely distributed and diffused. And like solar energy, it can be collected in substantial quantities only by large devices or arrays. But unlike solar collectors that gather heat, these devices collect the mechanical energy of waves — motion — which must be converted to some other form to be stored.

Although sea waves exhibit an apparent regularity, they are, in fact the combined effect of waves of many different wavelengths, moving not only among and through each other, but sometimes travelling in different directions. Although the basic physics of the generation and propagation of sea waves is relatively simple, and indeed serves as a guideline to their interpretation, the subject when treated in depth is one of considerable complexity.

**Classification.** Waves may be classified in a variety of ways as, for instance forced or free waves: an example of the former is the wave set up in a bath when sweeping a hand back and forth, while when the hand is removed the water runs to and fro as a free wave. Waves may also be classified as progressive or standing, the majority falling into the former class. However, standing waves occur, for example, when travelling waves are reflected from a harbour wall. Waves are also distinguished according to which of two restoring forces dominates when the water is disturbed: Ripples (or capillary waves), which are controlled by surface tension, have wavelengths of only a few centimetres, and die away rapidly through viscosity; the longer waves, known as gravity waves, are controlled by their mass in the Earth's gravitational field. The latter survive much longer, and are attenuated mainly by whitecapping (white horses) and self-destruction on coasts and beaches.

**Other types.** *Tsunamis:* These are waves caused by submarine earthquakes, oceanbottom land-slides or slumping, and volcanoes. They occur mainly in the Pacific Ocean and are characterised by having exceptionally long wavelengths, often hundreds of kilometres, and at their origins the wave heights may be only a metre or so. On account of this, they are seldom detectable on a ship, since the heaving is so slow. However, these waves carry large amounts of energy, and on reaching shoaling coastlines of distant lands, they slow down and pile up, causing great devastation and loss of life.

Surges, seiches, and bores: Surges are strictly speaking wind-generated waves travelling with a depression but fall more appropriately into the category of tides. Seiches (a word of early French-Swiss origin) are oscillatory waves set up on lakes and closed seas, either by wind-stress or local barometric pressure effects, the oscillation frequency of which is, in effect, a shallow-water wave, determined by the length, and configuration of the lake. The tidal front, is being thus constrained, builds up energy, resulting in a steepfronted step in the van of approaching water. The effect is further enhanced when the tide is faced with a strong counter-current from the river. This is an oversimplified description of what is, in fact, a rather complicated phenomenon.

Bores occur in many parts of the world: in the U.K. on the Seven and the Trent: in France, on the Orne, the Gironde and the Cousesnon (where it is called the 'barre'): in Canada, at the mouth of the Peticodiac in New Brunswick: in the U.S. at the mouth of the Colorado: and in South America, on the Amazon (there called the 'pororoca').

Internal waves and dead water: Internal waves can occur when water becomes stratified. For example, in calm weather in the Norwegian fjords and other Artic waters, a shallow layer of fresh water, from rivers and glacial melt can lie quescently above deep seawater, the fresh-water layer perhaps only a metre or so deep. A ship, with a draught exceeding the depth of the top layer, can excite internal waves at the interface of the two layers. Such waves have a very low velocity. Unprecedented progress in waves studies has been achieved through the use of polar-orbiting remote-sensing satellites using the microwave radar techniques.

It has been known for some time that there is a close connection between wave characteristics (height, wavelength, direction, and spectra) and the strength of the wind. This relationship is such that, given sufficient data on the sea-state at a particular time and place, one can assess the strength and direction of the surface wind at that site, a feature which cannot be obtained from meteorological satellites. These global data from satellite radars are of immense value in weather forecasting, and for measuring satellites, the latter being in turn the primary driving force for the ocean currents. The ability to measure and monitor, albeit indirectly, the global ocean currents, if of great value in many areas of research.

A drawback of wave energy is that like most forms of solar energy, it is intermittent. But wave power has one advantage; it is not subject to the rapid variations typical of wind energy. It is much more constant than wind energy. Waves not only persist long after the wind that caused them has calmed, but their energy content increases as the square of their height — six foot waves contain four times as much energy as three-foot waves, for example, in contrast, the power output of wind is proportional to the cube of its velocity — a 60 mile-per-hour wind contains eight times more energy than a 30 mile-per-hour wind. Still, despite these two advantages over wind, waves remain a diffuse and variable source of energy. Under normal conditions, waves deliver an average of between 10 to 100 kilowatts of power on every meter of beach in the mid-latitudes. But in a severe storm, 1 Megawatt per meter many arrive on the same coastline. Thus any device for harnessing wave energy must be capable of operating successfully — or at least surviving — under a wide range of conditions.

Wave-powered desalination systems could provide water for island communities. Wave-generated power could also be used to make hydrogen and ammonia from seawater and to refine aluminium. And converting wave energy into hydraulic power for transmission ashore has also been suggested. The most advanced large device for harvesting wave energy has been built by a group led by K. Masuda at the Japan Marine Science and Technology Centre in Yokusuka, with support from the International Energy Agency and participation from the United States, Canada, Britain and Ireland. In Norway, the "small is beautiful" concept has been applied to wave power by a group led by K. Budal and J. Falnes at the Norwegian Technical University in Trondheim. Their idea is that a large array of small, mass-produced wave-energy absorbers can be more rapidly and cheaply deployed and maintained than large structures. This concept has been tested extensively in laboratory wave tanks, and an intermediate scale is on trial in Trondheimsford.

Another approach to harnessing wave power is advocated by a group led by E. Mehlum at the Central Institute for Industrial Research in Oslo. This group has designed a 'wave lens' to convert to mechanical energy. The lens consist of a submerged cylinder that causes the wave passing the cylinder to be led differentially, changing their directions so that they meet at a focal point. Thus, the wave energy is concentrated just as an optical lens concentrates light energy. Wave energy is the one technology in which Britain is indisputably ahead. Other natural sites for wave devices include the coastline around Japan, numerous Pacific islands, the Western coast of N and S America (particularly California), W. Africa, Southern India and Sri Lanka, Portugal and northern Spain, Australia and New Zealand — the prospects are limitless for devices ranging from small harbour work providing refrigeration plants for fishing villages and de-salination projects, to the giant 2000 MW power stations which are the ultimate objective.

**British cost estimates**

| Estuary | Anual Energy out put TWA | Investment £M | Unit P/KW |
|---|---|---|---|
| Solvay | 10.05 | 4872 | 3.48 |
| More Combe | 5.40 | 2351 | 2.98 |
| Dee | 1.25 | 802 | 4.18 |
| Humber | 2.01 | 1392 | 4.54 |
| Wash | 4.69 | 3165 | 4.68 |

Britain's first wave power station is expected to begin c ration later this year on the Isle of Islay in the Hebrides Scotland. Shoreline wave devices such as that on Islay the power of waves concentrated in caves and rock gull or in similar structure of steel concrete, to drive special bine generators. Such stations are said to be economical build and, unlike offshore wave power machines are eas accessible for maintenance. The Islay prototype is expec to produce electricity for about seven pence a kilowatt ho a price that could be attractive to many island communit given the improved efficiency and low building costs of su stations, once the capital cost of the Islay station has be paid. However, the cost of its energy is expected to fall around two pence a kilowatt hour. Such economics wou allow for the complete replacement of the mechanical pla involved four times during the life of the station.

As with most other unconventional sources of energy, t economic prospects for wave power are too uncertain to stir ulate long-range planning and investment. The cost of ele tricity produced from large scale wave-power systems in optimal locations — including the cost of collecting dev ces, mooring, transmission and maintenance, with capital bo rowed at 10% amortized over 20 to 30 years — is place by — British consultants at p 10 to 20 per kilowatt-hour. Th compares unfavourably with the current cost to produce ele tricity in Britain and United States — about 5 cents pe kilowatt-hour. Engineers in the wave power field tend to b more optimistic about the ultimate performance and costs c wave-power devices, but many more designs and tests wi be required to justify this modest optimism.

Studies continue on harnessing wave power at special site where this technology could be economical. These sites ar typical island communities such as the Hebrides, Shet lanc and Feeroes where the waves are energetic and conventiona electrical generation is costly. Preliminary designs from the British wave-energy programme suggest that a variety of systems with capacities of one or two megawatts are possible for such sites. The simplest structures would be pneumatic device columns of water and air with turbine generators at the top attached to the ocean bottom close to shore. Fifty such structures along only 100 meters of coast would generate significant amounts of power, with minimal mooring and transmission costs. But backup fossil-fueled generators would be required to produce electricity during calm periods, unless customers did not need a constant supply of power.

In India, under a grant from the Department of Ocean Development, IIT Madras had gathered Scientific wave station near Madras harbour for two years using a Special Wave Rider Buoy. Some headway has been made using an occillation water column device. Actual wave power generator experiments off the Cochin coast are in progress. There can be no doubt that the coming century will witness considerable progress in this field.

— T.P.S. RAJAN

# CHEMARENA

.L. VENKITESWARAN

## Explosion and Fire in ARCO Plant

One of the worst in recent mishaps in chemical factories curred on 5th July at ARCO plant in Channelview, Texas, SA. It resulted in 17 deaths and many injured. This follows e explosion in a Phillips plant also in Texas with serious slocation in supplies of polyolefines, though only a few aths. The most devastating in terms of total dislocation of oduction was in the acetic acid plant of Celanese -- now oechst Celanese - about 3 years back. This plant was rebuilt same feedstock, butanes, and is back in production. The RCO plant was making styrene, propylene oxide and TBE in plants based on their epoch making technology of opylene oxidation to the oxide using peroxides - in this case ethyl benzene and of isobutylene in separate plants, ARCO world's largest producer of propylene oxide and had 1300 illion lbs of styrene, 560 million lbs of propylene oxide and 600 million lbs of MTBE capacity at this site.

The explosion is reported to have occurred in a storage nk while fixing a compressor which incidentally is used r venting hydrocarbon vapours into a flare. The damage said to be minimal in the production centres and produc- on could restart soon.

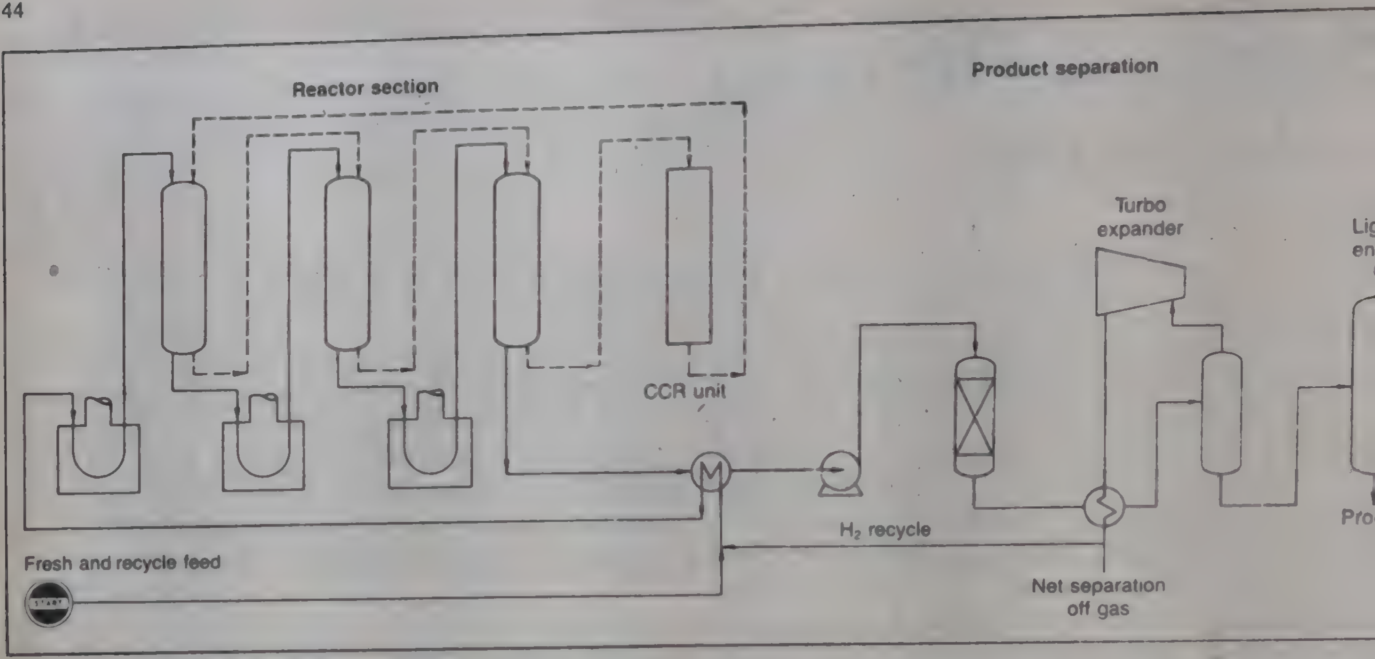
The exact cause of the explosion is under investigation. ut what is most disturbing to the authorities is the resort contract maintenance at factories as a cost saving mea- ire. The Phillips plant disaster also was due to this prac- ce. Whether the contract staff are not adequately in the know f the hazards involved in different plants which they handle r whether the personnel are subject to heavy load of work ver long hours or to inherent carelessness are not clear. Most f the dead in this ARCO case are of contract labour. The rganisation of Chemical and Atomic Workers (OCAW) is greatly perturbed by these practices and have raised the matter before industry and Government agencies. Instead of a motto of "Safety First, Last and Always" there is an undercurrent of "Profit before Safety" in some quarters and this could be particularly dangerous in the older plants. OSHA had charged Phillips Petroleum with negligence and whether this would be repeated with ARCO is to be seen.

There are serious lessons which India has to learn and absorb regarding location of plants -- more so with reference to the surroundings and environment. There is a tendency to place over-confidence in the designs and measures for safety built into the designs and accept assurances at face value. This approach seems to have crept in again after a brief interlude of overemphasis on safety in the wake of the Bhopal disaster. There are rules on location of factories away from city and town centres by several kilometres but apparently these rules get overhauled in cases of expansions of large chemical plants handling hazardous materials. Environmental appraisals tend to be disregarded in the interest of quicker additions to capacity at lower capital costs. The expansion of townships after the original installation, is not fully taken into account. Another aspect is the large increases in the road transport of hazardous chemicals from the production centres near townships, posing continuous dangers. Old plants are restarted after long breaks as an easy way to production without complete awareness of problems and snags -- recently an explosion in a reactor was reported from such a resurrected plant though no loss of life. Accidents in chemical plants (and refineries) seem to be far more frequent inspite of the best designs. Certainly authorities could see to it that the population of the neighbourhood do not have to face such an eventuality even of one in a million.

## $C_3$-$C_4$ dehydrogenation

The major development of recent years is the breakthrough n the dehydrogenation of propane to propylene in addition o the improvements in the $C_4$ dehydrogenation process mprovements. UOP of USA are the leaders in this area and ave acquired Houndry, one of the process leaders for $C_4$ in arlier years. UOP's "Oleflex" process is claimed to give high ields and good selectivity with moderate capital and oper- ting costs. The special innovation is of continuous operation with uniform catalyst activity due to the integral catalyst dehydrogenation cycle. Reference has been made in these columns earlier and now a paper has been published in *HP* of March '90 under Petrochemical Development by Mr. Pujado and Mr. Vora of UOP.

The processing unit consists of reactor and recovery sections. The reactor consists of 3 or 4 radial flow reactors,



charge and interstage heaters, reactor feed effluent heat exchangers and the CCR -- continuous catalyst regeneration -- systems. Outline flow sheet is shown in the above figure with three reactors for butane while four in series is said to be desirable for propane. For recovery, the reactor effluent is compressed, dried and sent to a cryogenic separator system. The gas after the condensation is separated into 2 streams -- recycle gas and net gas which is recovered as 85-93 mol % hydrogen which is well suited for use in many hydroprocessing applications. The separated liquids are fractionated. For $C_3$ there is a de-ethaniser and a PP (propane propylene) splitter to get pure propylene of upto polymerisation grade. Propane is recycled. If the downstream units can use the mixed P-P stream there is saving in costs as propane can be recycled back after the reaction. For $C_4$ there are also options depending on the downstream usage of the butylenes. Light ends are first recovered in a depropaniser and where $C_3$-$C_4$ mix is dehydrogenated a de-ethaniser is also required besides $C_3/C_4$ splitter and P-P splitter. The separations are the costlier part of the dehydrogenation system.

. Catalyst regeneration unit is similar to the practice in Platforming process of refineries. It helps to burn off the coke, redistribute the platinum and remove excess moisture. The slowly moving catalyst bed circulates in a loop through the reactors and regenerator with cycle time being adjustable -- 2 to 7 days usually. The hydrocarbon reaction section and the oxygen regeneration section are totally independent and no valves are required in large diameter lines. The regeneration section is a series of stacked reaction. The dehydrogenation is dependent on equilibrium conditions that are maintained with lower pressure and higher temperatures favouring dehydrogenation. A trade-off exists between conversion per pass and compression utility consumption.

For propylene, the overall selectivity from propane is 89-91 mol % and the expected flows for a 250,000 t/year pla as under:

| | tpy |
|---|---|
| **Feed** | |
| Propane (99.5% wt) .. | 295,54 |
| **Products** | |
| Propylene (99.5% wt) .. | 250,00 |
| Hydrogen (90 mol %) .. | 20,28 |
| Fuel components .. | 25,26 |

The economics depend on the price differential betw propane and propylene and costs under US conditions given as:

**250,000 t/yr Propylene**

| | $/to |
|---|---|
| Feedstock | 15 |
| Utilities | 5 |
| Catalysts & Chemicals | 1 |
| Capital related or other fixed costs | 7 |
| By-product credits | 7 |
| Total | 22 |

Payback period is estimated at 2.5 years for 250,000 5 years for 100,000 tonnes like the one proposed for the G cracker along the HBJ route.

The Oleflex process is sure to play a major role for fut olefine plants (higher than ethylene) and may help to red the size of "complexes" due to the volume of olefines l ited to one olefine. There are advantages in using this $C_3$-$C_4$ dehydrogenation using isobutane wherein the isob ylene is tapped off by reaction with methanol to MTBE leaving propylene for other products. The era of napht cracker complexes may end in a decade or two, more so w the pressure on liquid fuel needs and rising availability natural gas/LNG.

For Competitive Imports of Chemicals, Pharmaceutical
Raw Materials and Particularly for the Following Items

**Chloroform**
**Acetyl Chloride**
**Thionyl Chloride**
**Alpha Picoline**
**Benzaldehyde FFC**
**Cyclohexanone**
**Beta Naphthol**
**Epichlorohydrine**

PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

**CHEMET**

HEAD OFFICE:
Taj Building, 1st Floor, P.B.No. 195, 210, Dr. D.N. Road, Bombay: 400 001
Phones: 2043803/4/5/6/7 Fax. No. 2048854
Cable: DEGUCHEM Bombay Telex: 11-3229/11 4631 DGKM IN

CALCUTTA OFFICE:
Sharma House, 3rd Floor, 1/2 Lord Sinha Road, Calcutta-700 071
Phones: 447306 ■ 446155, Cable: DEGUCHEM Calcutta, Telex: 21-33 25 DGKN IN

MADRAS OFFICE:
10, Kondy Chetty Street, 1st Floor, P.B. No. 1709, Madras 600 001. Cable: DEGUCHEM, Madras
Phones: 582447 ■ 587617 ■ 580796 Telex: 41 7554 DGKM IN

DELHI OFFICE:
214, Hans Bhavan, Wing No. 1, Bahadurshah Zafer Marg, New Delhi - 110 002
Phones: 3311373 ■ 3319787 ■ 3319791 Cable: DEGUCHEM New Delhi,
Telex:31 65921, DGKM IN.

HYDERABAD OFFICE:
905/2, 9th Floor, Babukhan Estate, Basheerbagh, Hyderabad-500 001.
Phone : 242318, Telex: 0425 - 2188, DGKM IN.

## MANUFACTURE OF TITANIUM DIOXIDE

# TOMCO working on alternate sites

Tata Oil Mills Company Ltd., (TOMCO) is working on plans for setting up a green-field, export-oriented project for the manufacture of titanium dioxide. The company is expected to invest around Rs. 90 crores in the unit during the current year.

According to Mr. N.S. Sunder Rajan, managing director of TOMCO, the green field project is part of a contingency plan, in case its talks with the Kerala government for a stake in Kerala Minerals and Metals Ltd. (KMML) fail to fructify.

The Tatas feel that there is scope for one more titanium dioxide project of 50,000 tonnes per annum in the country, if raw material supply is to be sustained in the long run.

TOMCO is determined to set up a project of this capacity either through KMML or on its own. The alternative under consideration is to set up a project in Orissa, where it has identified rich raw material deposits, or Tamil Nadu or Maharashtra.

The final site will be decided within a year if no consent is received from the Kerala government. TOMCO's initial plans for an EoU at Ratnagiri in Maharashtra have been put on the back burner, due to doubts about the quality of raw material available.

The first choice, however is KMML. The company, currently in the public sector, is operating at 15 per cent capacity using the chloride route for manufacture. The company's losses stand at around Rs. 85 crores and its net worth has eroded several times.

TOMCO proposes to rehabilitate the company in a period of 12 to 18 months by first increasing the capacity utilisation to over 60 per cent and then increasing it to 50,000 tonnes per annum.

### UB Group, Kanorias enter the fray

The several-week-old uncertainty has assumed new dimensions lately with the UB group and the Kanorias approaching the Kerala government with fresh proposals and the Tatas themselves being doubtful about their project.

According to top sources Mr. Vijay Mallya's UB group, which of late has been on a take-over spree expanding and diversifying into new areas, is now a strong contender for the Kerala titanium dioxide project. The UB group already has its McDowell distillery unit at Sherthalai in Kerala. Although at present this is the UB group's only activity in the state, the group is learnt to be having an excellent rapport with the Kerala industry minister Mrs. K.R. Gouri. The group is therefore allegedly using its clout over the state industry minister to see that the titanium dioxide project is denied to the Tatas and given to the UB group.

Sources close to Mrs. Gouri admit that she has a soft corner for the UB group. But to what extent this could influence the decision is to be seen, the sources said. Besides the UB group, the others in the fray include the Kanorias and Birlas.

However the special adviser to the Kerala government on industry, Mr. K.P.P. Nambiar, perhaps the only person who advice is taken seriously by the state industry minister Mrs. Gouri, is still hopeful that the Tata project will be cleared by the Kerala government. Mr. Nambiar said, that the government had not declined the Tata's offer. He added that it is still under active consideration. Asked to explain the inordinate delay in getting back to the Tatas, Mr. Nambiar stated that this was because a high level political decision was necessary as it involves the delicate question of converting a publi into a joint venture allowing privat ticipation.

---

## Rs. 300-cr. MODI RUBBER PROJECT CLEARED

The Rs. 300-crore butyl rubber ject of Modi Rubber had been cle by the petroleum ministry. Accordi Modi sources, the project is a joint ture between the Modis and the So Union, and is to be located at I Kalan, in Mathura, UP. It will be largest Indo-Soviet joint venture in private sector.

The plant will have a capacity manufature 25,000 tonnes of bu rubber per annum. Though imports currently in the range of 16,000 tonn demand is expected to grow quic once the indigenous production is ava able.

The Soviets and the Modis will ho 40 per cent each of the equity of t company. It will be a 100 per ce import substitution project as there a no indigenous manufacturer of this sp cial synthetic rubber. The Soviets are t largest manufacturers of synthet rubber in the world.

Besides, participating in the equity the Soviets will provide the plant an machinery along with the know-hov and will also extend soft loans unde their standard credit system.

Butyl rubber, due to its special property of air retention, finds wide application in the manufacture of the inne tube of an automotive tyre. The project will be in Rupee currency under an umbrella agreement between India and the USSR. Modi Rubber has signed a memorandum of agreement for joint venture with the ministry of oil refining and petrochemicals industries.

The plant will be provided the C-4 stream raw material from the Mathura Refinery.

For Your Import Requirements Of

**Ethyl Glycol**
**Ethylene Glycol Monoethyl Ether**
**Hydrogen Peroxide 50%**
**Polyoxyethylene Nonylphenyl Ether**
**Cobalt Sulphate**
**Sodium Hydrosulphate**
**Pyridine Pure**

PLEASE CONTACT:

**PRIYA CHEMICALS**

HEAD OFFICE:
Podar Chambers, 4th Floor, S.A. Brelvi Street, Bombay 400 001
Phones: 2860596 ■ 2863611 ■ 2863676 ■ 2863783 ■ 2863900
Telex: 0118-5495 PRIA IN ■ 0118-6556 PRIA IN ■ 0118-2472 PODR IN

BRANCHES
— HYDERABAD OFFICE —
Prashanthi Commercial Complex, 6-9-30/6 to 8/B, 2nd Floor, Basheerbagh,
Hyderabad - 500 029 Phone: 236068

— DELHI OFFICE —
Flat No. 8, 10th Floor, Akash Deep Bldg., Barakhamba Road, New Delhi - 110 001
Phones: 3314512 ■ 3310413

— BANGALORE OFFICE —
Devatha Plaza, 131/132, Residency Road, Bangalore - 560 025 Phone: 214027

— MADRAS OFFICE —
5-J Century Plaza, 560-562 Mount Road, Teynampet, Madras 600 018.
Phone: 451597 ■ 451031 Telex: 041-8809 PRIYA IN

— CALCUTTA OFFICE —
"LORDS", 3rd Floor, 7/1, Lord Sinha Road, Calcutta 700 071
Phone: 222378 ■ 222379 ■ 228015 ■ 226367 ■ 300765

# IPCL acquires knowhow for AO

Indian Petrochemical Corporation Ltd. (IPCL) has got technology offers for producing Alpha Olefins (AO), for the first time in India.

Alpha Olefins manufacture is a closely held technology held by half a dozen firms worldwide. There was conisderable speculation whether IPCL will get technology for this chemical which is now wholly imported. The leading AO producers include Shell, Ethyl Corporation, Chevron and few Japanese firms.

The product range consisting of Alpha Olefins, alcohol ethoxylates and primary alcohols represents a new generation of chemical products that find uses in detergents, toiletries, plasticisers synthetic lubricants etc. These will be produced for the first time in India and there are very few manufacturers in the world.

The AO project is part of the Gandhar Petrochemical Complex which IPCL plans to set up on a 400-hectare plot near Jageshwar village in Bharuch district of Gujarat. It will cost Rs. 2665 crores including foreign exchange component of Rs. 510 crores. It will be based on nine million standard cubic metres per day of associated and free gas that would be available from the Gandhar oilfields of ONGC.

The C2, C3 streams will be used to produce three lakh tonnes per year of ethylene and other feedstocks. Other products besides AO are 1.5 lakh tonnes of PVC, one lakh tonnes of MEG, 20,000 tonnes of EO, one lakh tonnes of alcohol ethoxylates and one lakh tonnes of primary alcohols.

The complex will also include a chloro-alkali plant to produce 1.05 lakh tonnes of chlorine and 1.3 lakh tonnes of caustic soda and a 75 mw gas based power plant. The petrochemical complex will also incorporate an elaborate environment and ecology management system to be set up at a cost of Rs. 25 crores. This will not only control effluent, air and noise to international standards but also incorporate a green belt covering 200 hectares of land, environmental impact studies and horticulture activities.

## XYLENE EXPANSION FACILITY DEDICATED TO NATION

The xylene expansion facility of Indian Petrochemicals Ltd. (IPCL) was dedicated to the nation by the Union Petroleum and Chemicals Minister, Mr. Gurupadaswami, at Baroda on 23rd July.

On this occasion, the Minister said that it is necessary, given the resource constraint and the sizeable and significant programme that we have taken up, to use the existing resources and investment in an effective manner. This gets priority over using the resources for new facility.

The Minister observed that the country has taken up a programme to substantially increase the base for petrochemicals in India.

On the aromatics components of petrochemicals, covering orthoxylene, paraxylene, benzene and toluene, it has been planned to substantially improve the indigenous base.

The Gandhar petrochemicals complex is one of the major proposals in developing the indigenous base on olefins (ethylene, propylene, butadiene) and their downstream products. The Minister visited the site of the proposed Gandhar petrochemical complex. Given IPCL's track record, both at it's Baroda and it's Nagothane complex which were recently commissioned, he hoped that this would be successful in reality.

The Minister stated that in all these endeavours, it is important to take up programmes concerning employment
generation, small industry prom
environment and ecology protecti
which the Government is comm

The petrochemical industry
potential to develop small and co
units in the downstream processing
tors.

Associated to this is creatio
employment in the processing se
He suggested that the industry pay
cial attention to this aspect in the de
opment of the processing sector.

## PLASTIC INPUT IMPORTS: CHANGES LIKELY IN CUSTO VALUATION

To check rampant underinvoicin
plastic raw material imports, the
toms authorities have sought
replacement of the *ad valorem* rate
countervailing duty (CVD) with spec
rates.

Addressing the members of Bh
Chamber of Commerce, on July 2
Mr. P.M. Malhotra, Collector of C
toms, Calcutta, said that the Fina
Ministry's attention had been drawn
the increasing problems of assessm
stemming from the present system
valuation of plastic raw mater
imports.

He said that in view of the sharp flu
tuations in the international prices
plastic raw materials many of t
importers claimed lower CVD on t
basis of old invoice prices.

According to the chamber, delays
clearance of imported consignmen
resulting from the customs authority
refusal to accept prices given in th
invoice is hindering the operations of
large number of processing units. M
Malhotra urged the chambers of com
merce and various associations of plas
tic processors to provide th
international prices of the raw mater
als on a regular basis which would hel
expeditious clearance of consignments

# IL to raise more funds for cracker project

eliance Industries Limited proposes ap the market to meet a large por- of the shortfall in funds required for ing up its gas cracker project on can- ation of its suppliers credit of 510 crores by Larsen & Toubro.

Options now being considered by the board: to raise fresh debentures, h convertibles and non-convertibles, -over existing outstanding non- vertibles of Rs. 323 crores and raise ed deposit substantially from the el of Rs. 70 crores. Any proposal ulting in the increase in the compa- 's equity capital will be considered at last stage. The company has the tential to borrow over Rs. 2,100- ores in view of its current low debt- uity ratio of 0.55:1.

The revised means of funding the oject, now estimated to cost Rs. 980 ores, are being discussed with finan- al institutions.

Originally, the gas cracker project as proposed to be financed through the &T suppliers credit of Rs. 510 crores, reign exchange loans of Rs. 200 ores, and the balance through inter- al accruals. With the cancellation of the &T suppliers credit, the dependence internal accruals and market raisings as increased substantially.

The management feels that the com- any's internal accruals are quite large nd are slated to increase year after year view of the brisk demand for petro- hemicals. The company's gross profit mounted to Rs. 252.47 crores for 89-90 as against Rs. 166.17 crores for he previous nine-month period.

The gross profit for 1989-90 is, how- ver, after providing Rs. 44.01 crores as xpenses and losses incurred on account f floods at the Patalganga plant in July ast year. The directors have proposed dividend of Rs. 3 per share — the ame amount for the previous nine nonths period which would claim Rs. 45.64 crores. Thus, retained accruals for 1989-90 amounted to Rs. 250 crores.

RIL has received all the necessary approvals for the gas cracker project which is being located at Hazira in Gujarat. The work on the project is estimated to begin by the end of 1990 and the cracker is likely to be commissioned before the end of 1993-94. The cracker, the only one approved for the Eighth Plan period will have a capacity of four lakh tonnes of ethylene, 1.80 lakh tonnes of propylene and 95,000 tonnes of butadiene.

Besides RIL is in the process of expanding the present capacities at Patalganga plant with an additional investment of Rs. 400 crores during the current year. The production capacity of the PTA plant is being raised from one lakh tonnes to two lakh tonnes per annum along with paraxylene capacity from 80,000 tonnes to 1.50 lakh tonnes.

The production of PTA during 1989-90 was higher around 1.23 lakh tonnes against 80,000 tonnes in the previous year.

## R. NATARAJAN: NEW CAMA PRESIDENT

Mr. R. Natarajan of Associated Agencies (Bombay) has been unanimously elected President of the Chemical and Alkali Merchants Association for the year 1990-91. Mr. P.H. Talati was chosen the new Vice President; Mr. Arun Doshi and Mr. Jayendra Sheth are the Hon. Secretaries. A report of the AGM which was addressed by Mr. Gazder and Mr. V.B. Sharma, Deputy Commissioner of Bombay Municipal Corporation will be published the next issue.

For the most competitive CIF price of

**Ortho Anisidine**
**Acetic Anhydride**
**Ortho Toluidine Liquid**
**Orthanilic Acid**
**Para Anisidine**
**and other chemicals**

Please Contact:

**Mr. DHAIRESH K. SANGHVI**
**M/s. KANTILAL SANGHVI & CO.**

Union Co-operative Insurance Bldg.,
23, Sir Pherozeshah Mehta Road,
BOMBAY 400 001
Phones: (Office): 2870836/2873217/2873628
(Resi.): 4226850/4229086
Telex: 1185725 EXIM IM Gram: EXPIM, Bombay
Fax: (22) 2874153

### ALLOCATION OF CAPROLACTAM

## ‘GSFC favouring Gujarat Nylons’

Gujarat State Fertiliser Company (GSFC) has been favouring Gujarat Nylons in allotments of indigenous caprolactam, it has been alleged. The indigenous material is substantially cheap when compared with the landed cost of the imported lactam.

GSFC is the sole producer and supplier of caprolactam in the country to nylon yarn spinners. The company used to supply 15,000-16,000 tonnes of caprolactam per annum to the nylon spinners per annum. The figure fell to 9,000 tonnes during the last year and supplies are expected to go down further to 7,000-8,000 tonnes during the current year. This sharp reduction in the supply of indigenous caprolactam, according to nylon spinners, is due to the commissioning of its sister concern, Gujarat Nylons, which has a licensed capacity to produce 6,000 tonnes of nylon filament yarn per annum. Gujarat Nylons is a separate legal entity and GSFC, along with Gujarat Industrial Development Corporation, has financial interests in the company. GSFC is supplying caprolactam to Gujarat Nylons to meet its full raw materials requirement. As a result, nylon spinners other than Gujarat Nylons will now be getting only about ten per cent of their requirement of caprolactam from indigenous sources while their competitor, Gujarat Nylons, will receive its full requirement from GSFC at a price advantage of round Rs. 17,000 per tonne. The landed cost of imported lactam works out to around Rs. 56,000 per tonne due to the high rate of import duty and the changing rupee/dollar exchange rate, against the price of Rs. 39,000 per tonne of the indigenous material.

According to spokesman for the Association of Synthetic Fibre Industry (ASFI), Gujarat Nylons will have a cost advantage over its competitors, thus outpricing other nylon yarn producers. All along the distribution of caprolactam by GSFC amongs nylon spinners has been fair and equitable. All producers of NFY were alloted the material on a pro-rata basis depending on their yarn production. In the past few years, quarterly recommendations for such allocation of caprolactam were issued by ASFI based on the best three months production during the previous six months. The problem seems to have arisen recently with the commissioning of Gujarat Nylons. Spinners have urged the government to persuade GSFC to revert back to the ‘equitable distribution policy’ for all consumers, including Gujarat Nylons. Meanwhile, GSFC is understood to be considering raising the price of caprolactam.

The last increase in its price — Rs. 36,500 to Rs. 39,000 per t —was in June 1989.

The move to jack up the price app to be in anticipation that FACT charge a higher price when it comm ces caprolactam supplies.

Spinners are apprehensive about likely hike in the price of caprolact and has suggested that BICP undert a fresh cost study of caprolactam.

They have pointed out that the pr of Rs. 22,000 per tonne, fixed by GS in August 1980, was high when co pared to the BICP recommended pri of around Rs. 19,000.

---

### EARLY CLEARANCE OF VIZA PROJECT SOUGHT

The case for an early clearance of th Vizag naphtha cracker complex ha been emphasised by the Chief Ministe Dr. M. Chenna Reddy, at Hyderabad o 30th July, while addressing the Stat Members of Parliament on the eve o the Parliament session. Dr. Reddy state that Vizag is stated to be the best site for location of the cracker complex in view of the availability of naphtha and facilities for import and export at the port.

"34TH YEAR OF SERVICE"
A RELIABLE & DEPENDABLE HOUSE FOR CHEMICALS & SOLVENTS PARTICULARLY FOR

CAUSTIC SODA LYE
(In Tanker Loads)

Consumers Kindly Contact
PURCHASE & SALES EXCHANGE

345, Samuel Street, Bombay 400 003.
Telephones: 327129/341105/6887582
Tlx.: 011-74476 ATTN.: 0398
011-74498 ATTN.: 0398
Fax: 287-1441 ATTN.: 0398
287-2220 ATTN.: 0398
ESTD.: 1955
Associates: TEJ ENTERPRISES

FOR YOUR IMPORTS AT COMPETITIVE CIF PRICES

Melamine
Nitromethane
Propylene Glycol USP/Tech.
Trimethyl Phosphite
Thiophenol
Dimethyl Thio Phosphoryl Chloride
Diethyl Thio Phosphoryl Chloride
Epichlorohydrin
2,4 Dichloro Toluene
Thiourea
Hydroxy Propyl Acrylate
Hydrogen Peroxide 50%
3,4 Dichloro Nitro Benzene
Dimethyl Formamide
Piperazine Anhydrous
Cellulose Powder
Lactose (Ex-NCZ)
Sodium Bichromate
Alkyl Benzene Hard
1 Bromo 3 Chloro Propane
Thiophene

Tartaric Acid
Methyl Chloro Formate
Dimethyl Sulphoxide
Pivaloyl Chloride
2-Amino Thiophenol
Cupric Chloride
Cyclohexylamine
Cyclopropylamine
2-Chloro Propionic Acid
2-Chloro Methyl Propionate
Hydroxylamine Sulphate
Pyridine Pure 2°
Iodine
Beta Naphthol
Butylated Hydroxy Anisole
Trichloro Ethylene
Perchloro Ethylene
Dimethyl Carbonate
Guaiacol
Ortho Chloro Benzaldehyde
Benzaldehyde
Succinic Acid
N-Chloro Succinimide

**Please Contact for further details:**

S. AMIT & CO.

A TRUSTED NAME FOR IMPORT OF YOUR CHEMICALS
105, Neelam Centre, "A" Wing, Hind Cycle Road,
Worli, Bombay 400 025.
**Phones:** 4934627-28/4933310
**Telex:** 011-76877 CMIT IN
011-74486 AMIT IN
**Cable:** "DULICTOL"
**Fax No.:** 22-494950-4
**Madras Office:** Queens Court, 134, Montieth Road, Madras 600 008.
**Phones:** 860172/866942
**Hyderabad Office:** 8-3-215/7 (First Floor), Srinivasa Nagar Colony (West),
HYDERABAD-500 890.
**Phone:** 35110

Our Associates: M/s. CHEM AMIT

# Hoechst, Burroughs Wellcome challenge demand notices

Hoechst India and Burroughs Wellcome have challenged the demand notices received in June from the government for payment of unintended profits under the Drug Price Equalisation Account (DPEA), and also claimed entitlements to setoffs for unintended losses.

Unlike Glaxo India, which has also claimed set-offs and taken the government to court, these two companies are not planning court action immediately, but have not ruled out that option.

Hoechst, which had earlier received three notices demanding payments to a tune of Rs. 23 crores, subsequently got two more notices claming another Rs. two crores. The company claims that not only is the amount of Rs. 25 crores not payable by it, but also that it is entitled to a compensation of about Rs. 11 crores from the government.

Similarly, Burroughs Wellcome, which has been asked to pay up Rs. four crores, claims that the Government owes it Rs. 1.42 crores, to compensate for increases in prices of sulphamethoxazole that have not been incorporated in the formulation prices. The company's contention is that of the Rs. four crores demanded by the government, only Rs. 1.22 crores is payable by it, and that this should be adjusted against the Rs. 2.64 crores it has claimed as setoffs.

The drugs covered by the notices served on Hoechst are baralgan ketone, sterile pyrolidino methyl tetracycline (PMT), frusemide, glybenclamide and pheniramine maleate. In the case of Burroughs Wellcome, the notice is with respect to sulphamethoxazole. Senior company officials say that if the claims for set-offs are extended to other drugs where changes in input prices have not been compensted for in the prices of formulations, they will run into "astronomical figures".

Hoechst claims that between 1981 and 1987 which is the period covered by the demand notices, its pharmaceutical division's domestic business incurred a cumulative loss of Rs. 2.47 crores as a result of the government not granting price revisions in formulations to offset the increased cost of certain bulk drugs used as inputs. Further, the company claims that it has been denied price increases in bulk drugs and formulations amounting to Rs. 8.5 crores during the seven year period, which it is entitled to by virture of its production of bulk drugs and expenditure on research and development.

Hoechst, however, is yet to make a case for claiming another Rs. eight crores it says is due from the government, for production of bulk drugs. Under the Drugs (Prices Control) Order of 1987, bulk drug manufacturers are entiled to a post-tax profit of 12 to 14 per cent on their production. The company has in fact incurred a loss of Rs. 12.49 crores on bulk drugs between 1981 and 1987, which have been partially absorbed by the profit of Rs. 10.02 crores made on formulations during the same period.

## UNINTENDED LOSSES: GLAXO CLAIMS COMPENSATION

Glaxo India Ltd. has made a claim of about Rs. 37 crores on the Union government as compensation for unintended losses incurred by the company on certain product categories between 1981 and 1987.

These losses have been incurred as a result of unremunerative price fixations, delays in obtaining price approvals and the failure of the government to accommodate changes in various input costs, including prices of raw materials, among other factors, according to Mr. H. Dhanrajgir, managing director
company.

If this demand is conceded b
ministry of petroleum and chemic
will be set off against the recent de
of Rs. 66.35 crores made on the
pany by the ministry under the
prices equalisation account (DP
The company has contested this de
in a petition field in the Delhi
Court that will come up for hearin
August 9. The ministry's dem
notice, which was issued on June
claimed that the company had m
unintended profits in its betamethas
product range, between May 1981
August 1987. The company's con
tion is that the ministry's calculat
are based on erroneous figu
"nothing is due from us to the gove
ment", said Mr. Dhanrajgir, "In f
the government has to pay us." He s
port's his argument by pointing out
the amount claimed by the governm
is in fact higher than the entire pro
made by the company during the s
year period.

Earlier, in September 1989, the min
try had made a similar demand
Rs. 37 crores with respect to alleg
unintended profits made by the co
pany in its betamethasone range of pr
ducts. The company contested the ord
and after a quick study, arrived at
figure of Rs. 8.19 crores, which w
paid to the government in four stag
by December 1989. Even as it made t
payment, the company took the positi
that if subsequent investigations show
that the amount was not due to the go
ernment, it should be refunded.

## INDUSTRIAL GAS: DGS & D POLICY FLAYED

The All-India Industrial Gases Ma
ufacturers' Association has charged th
Director General of Supply and Disp
sal (DGS & D) of indulging in seriou
discriminatory practice while confirm
ing the rate of contract for industri
gases — oxygen and acetylene.

# Govt. only reviewing drug policy

The Union Minister for Petroleum l Chemicals, Mr. M.S. Gurupadas-mi, has said that the government is t formulating a new drug policy but eviewing the existing policies, which a continuous process for the Govern-ent.

This statement by the Minister comes the wake of a two-day strike threat ven by various pharmaceutical and ug manufacturers associations on igust 7 and 8.

Speaking to newsmen soon after an tensive meeting with various traders d manufacturers of drugs at New elhi on 31st July, the Minister stressed e need for a fast growth and expan-on of the drug industry in the country order to ensure increased exports, ore margins and reasonable returns. e urged the pharmaceutical industry to oncentrate on the production of basic rugs and to invest more on research nd development for new and better uality drugs.

The production of drugs in the coun-y this year has been to the extent of s. 843 crores, recording an increase of bout 80 per cent over the figures of last ear. India has also had the distinction f exporting important and life saving lrugs to quality conscious countries like he U.S., West Germany, the UK, Swit-erland and Japan.

Regarding the issue of drug prices rought up by the traders at the meet-ng with the Minister, he said the Supreme Court had given the Govern-ment the right to fix prices for drugs and the Government does so according to the data available to it from the indus-ry as well as the BICP.

He also urged the industry to supply the Government with appropriate and accurate data so that proper prices are fixed. Mr. Gurupadaswamy said that when the Ministry include drugs for price control, it was done primarily to protect consumer interest and on the basis of information available. He said that the National Front Government's resolve is to ensure the supply of quality drugs at competitive prices without affecting the consumers. On the plea of escalating cost of production vis-a-vis the price fixed by the Govt., the Minister said that his Ministry was not as arbitrary as it has been criticised to be.

He said that the Government has a practice of reviewing and revising drug prices every three years but it was not bound to as it was not mandatory under the law. But he said as it has been a practice, he would like to follow it. Regarding set-offs for manufacturers, the Minister informed that he or the Ministry was not competent under the law to give any set-ofs. He told the traders that all the due money collected by the Government from the manufacturers goes to a fund which is maintained for the development of the drug industry itself. The Minister negated reports that he was trying to bring down the trade margins on drugs.

### DRUG BANDH POSTPONED

Drug industry and trade has put off the two-day bandh planned from August 7. This follows an assurance given by Mr. M.S. Gurupadaswamy, Union Minister for Petroleum and Chemicals, to look into their grievances. The representatives of Joint Council of Pharmaceutical Industry and Trade, which gave the strike call, met the Minister in Delhi on July 31.

The Chairman of the Joint Council, Mr. Kishore Shah, said that the Minister had agreed with the industry's view that there have been cost escalations necessitating price increases, and actual increase in input cost will be considered for price fixation.

FOR MOST COMPETITIVE CIF OFFERS FOR:

**O.T. Liquid**
**Ortho/Para Anisidine**
**Bon Acid**
**and other Chemicals**

Please Contact:

**M/s. K. SANGHVI & CO.**

308, 'Gulab' 3rd Floor,
237, P.D 'Mello Road,
Bombay 400 001.

Phone: Office: 2612232/2610711 Resi: 8128473/8226451
Telegram: KEYSANGHVI Telex: 11-73516 KSC IN
Fax No.: (22) 2618970

# Package to revive sick drug units on cards

A restructuring of the sick public sector pharmaceutical units under the Department of Chemicals and Petrochemicals in the Ministry of Petroleum and Chemicals is on the cards. The Ministry plans to finalise the rehabilitation packages for such units and implement them as soon as possible. The rehabilitation packages, apart from the financial restructuring, will include modernisation of plant and adoption of sophisticated technologies, change in the product-mix wherever necessary and steps to increase productivity.

At the same time, an exercise will be undertaken soon to reorganise the pharmaceutical public sector undertakings so that they become more homogenous administratively and the unnecessary competition within the State sector is put to an end. To achieve this objective, the Minister of State for Petroleum and Chemicals, Mr. Bhajman Behera, had a daylong meeting with the chief executives of the sick State pharmaceutical companies on July 25.

Mr. Behera's main concern at the meeting was to have detailed discussions on the various aspects of each individual unit to be in a better position to make realistic plans for improvement and render the units profitable. Urging the chief executives to find the best solutions for improvement in their performance, Mr. Behera said the public sector drug units have an important role in making available quality drugs at reasonable prices to the consumer.

With a total investment of about Rs. 500 crores, Mr. Behera said the public sector drug units were producing important and life-saving medicines and at the same time employing about 19,000 workers. In no other sector, he said, such a large number of people have been employed against this level of investment. He said the restructuring of the Central drug units was a must to e
their healthy functioning and plans
being finalised accordingly on pr

The Minister, however, noted th
public sector undertakings were m
vying with each other in order to
institutional and Government orde
wondered as to why their presen
trade sales was marginal and has
been improving over the years de
the huge workforce available with t
He urged the chief executives to th
light on the market strategies being
lowed by the State units vis-a-vis
private sector units and pinpoint
weaknesses in this regard.

Mr. Behera also emphasised the n
to increase exports and the role
public sector should play in this fi
The chief executives were, in turn, he
in detail with regard to the profile
their companies, the cause of their
ness and the strategies to be follow
for bringing them out of the red.

CONTACT FOR MOST COMPETITIVE CIF PRICE FOR

Astimazole/Captopril
Erythromycin Thiocyanate
Gallic Acid/3,4,5-T.M.B.A.
Iodine Crude
L Base/C.P. Base
Sulphadiazine/Sulphadoxine

Aniline Oil/Acetanilide
3 Cyano/4 Cyano Pyridine
D.M.F./M.E.K./M.I.B.K./T.H.F.
Ethyl/Methyl Glycol
Glyoxal 40%/Pyridine
T-Butylamine/Trimethylol Propane

SATYAN PHARMACEUTICALS PVT. LTD.

Diamond House, 491-493 Kalbadevi Road, Bombay 400 002.
Tel: 25 00 50 & 31 62 50 Telex: 0118-5210 SPL IN

BR. OFFICE: 114 Thambu Chetty Street, Madras - 600 001.
Tel: 51 39 67 & 51 08 51

SC

Star Chemicals

FOR YOUR IMPORT REQUIREMENTS OF

**Diclofenac Sodium Injectable Grade**
**Chlormezanone**
**Chlorzoxazone**
**Diprophylline**
**Diclofenac Potassium**
**Oxethazine**
**2,6-Dichloroaniline**

**And for other Chemicals, Pharmaceuticals & Intermediates**

PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

MADRAS OFFICE:
D-4, 2/36 RAMS SQUARE
2, Village Road
MADRAS 600 034
Tel: 864430/8250097
**Tlx: 041 25164 STAR IN**
FAX: 044 473762

HYDERABAD OFFICE:
'NALANDA' Unit No. 7
6-3-649, Somajiguda
Hyderabad 500 482
Tel: 210288
**TLX: 0425-6131 STAR IN**

OUR LOCATION DOES NOT MAKE ANY DIFFERENCE TO OUR COMMITMENT TO SERVE YOU

Available from local Manufacturer
(Equivalent to Import)

DICHLONE
PARA CHLORO META XYLENOL (PCMX)
PARA CHLORO META CRESOL (PCMC)
2-CHLORO PROPIONIC ACID
ISO PROPYL CHLORO ACETATE
PROPIONYL CHLORIDE
PROPIONIC ANHYDRIDE

Please Contact

**RICCI INDENTING & AGENCY HOUSE PVT. LTD.**

319, Panchratna, Opera House, Bombay 400 004.
Tel. Office: 8110394/8115612 Resi: 387251

*EXPORT ENQUIRIES SOLICITED*

---

**Contact For Your Requirements of**

**ERYTHROMYCIN ESTOLATE I.P.**
**ERYTHROMYCIN STEARATE I.P.**
**RIBOFLAVINE PHOSPHATE SODIUM I.P.**

MANUFACTURED BY :

**Sanjivani**

**DRUGS AND PHARMACEUTICALS**

PLOT NO. 617, PHASE IV, BEHIND NEEKA TUBES, G.I.D.C., VATVA,
AHMEDABAD-382 445. PHONES : (O) 831673, 830851. (R) 413773

---

AVAILABLE EX-STOCK WITH MODVAT BENEFITS

PROPYLENE GLYCOL USP -- DOW/ARCO
AEROSIL 200 NF
POLYVINYL PYRROLIDONE
  P.V.P.-K 30/KOLLIDONE 30 USP
ETHYL CELLULOSE NF "ETHOCEL"
  GRADES: N-7, N-10, N-20/22, N-45/50, N200
MICROCRYSTALLINE CELLULOSE NF/USP "AVICEL"
  GRADES: AVICEL PH 101, AVICEL PH 102, RC 581/591
BUTYLATED HYDROXY ANISOLE (B.H.A.)
TERTIARY BUTYL HYDROQUINONE (T.B.H.Q.)
METHYL / PROPYL PARABEN
ETHYL / BUTYL ACETATE
I.P.A.
CARNAUBA WAX / CANDELILA WAX
VANILLIN
TITANIUM DIOXIDE ANATASE / PHARMA U.S.P.
HYDROXY PROPYL METHYL CELLULOSE (H.P.M.C.)
  USP - 2910
  METHOCEL E3, E5, E15, E50, K4M, E4M, K100, K15M
  PHARMACOAT 603, 606, 615
CELLULOSE ACETATE PHTHALATE USP (CAP)
LACTIC ACID 88-92% U.S.P.
HYDROXY ETHYL CELLULOSE "NATRASOL" LR/GR
SODIUM STARCH GLYCOLATE "PRIMOJEL"
MAGNESIUM ALUMINIUM SILICATE NF "VEE GUM /
  VEE GUM HV / VEE GUM F"
CARBOMER / CARBOPOL 934, 940
POLYSORBATE "TWEEN 20, 40, 60, 80"
HPMC -- COLOUR LAKE READY MIX FOR TABLET COATING IN AQUEOUS/NON-AQUEOUS BASE "LUMI-NO-DIS"

*CHEMICIRCLE PHARMACEUTICALS*

Shree Krishna Niwas, Room No. 51, Corner of B. Master Road, Kalbadevi, Bombay 400 002.
Phone: 318583, 313251; Resi: 481595; Tlx: 011-76777; Fax: 287 2134

For **IMPORT** of following Products

**(ASC) N-Acetyl Sulphanilyl Chloride (Japan)**

(Important High quality intermediate for Sulpha Drugs & Vinyl Sulphone.
Also to avoid use of Chlorosulphonic Acid and pollution problem)

- Isobutyl Benzene
- Bisphenol-A (Japan)
- L-Lysine Feed & Pharma Grade
- DL-Methionine Feed Grade
- Various other Amino Acids
- Epichlorohydrin
- Cellosolve/Carbitol
- Furfuryl Alcohol
- Triethylamine
- Beta Picoline
- 3-Cyanopyridine
- Perchloroethylene
- Ethoxylated Nonyl Phenol 9.5 Mol (Emulsifier)
- N,N-Dimethylaniline
- Dimethyl Sulfoxide
- Diethyl Sulphate
- Cyclohexanone
- Rangolite
- Phenol
- MDI/TDI-80/20
- Naphthalene Crude
- Iodine Crude (Japan)
- Propylene Glycol
- Acrylamide
- Thiourea
- Pyridine Pure
- Guanyl Thiourea
- Morpholine
- Sulphadiazine
- Thioglycollic Acid
- Gamma Picoline
- 4-Cyanopyridine
- Meta Nitro Acetophenone
- Ortho Anisidine
- 2-Chloro Propionic Acid
- 2-Ethyl Hexanoic Acid
- N,N-Diethylaniline
- Para Chloro Benzoic Acid
- Ethyl Cyano Acetate
- Ortho Chloro Aniline
- Aniline (Japan)
- 2,6 Xylidine

and various other industrial chemicals/intermediates/fine chemicals pharmaceuticals etc.

Please Contact the Indenting Agent:

PACIFIC

**M/s. PACIFIC AGENCIES**

41, Prospect Chambers Annexe, 3rd Floor, 317, Dr. D.N. Road, Bombay 400 001.
**Telephone: Office: 2044482/244923/232833**
Residence: Mr. Lathi 5113387 Mr. Vyas 5121909
Telex: 011-86799 PCFC IN

DRUG INDUSTRY

## Pragmatic policy to be followed

The petroleum and chemicals ministry will follow a pragmatic policy regarding the drug industry in the country. While giving enough margin to the drug units, the policy will ensure that the interests of the consumers are not affected.

Talking to **The Economic Times,** the petroleum and chemicals minister, Mr. M.S. Gurupadaswamy said that he would like the drug industry in the small-scale sector to stand on its own. Today, it is dependent on large-scale units. Though the loan licencing scheme has been extended this year to help the small scale sector, ultimately this sector must stand on its own. It must improve quality.

Mr. Gurupadaswamy said that he believed in adopting a flexible approach towards the problems of the drug industry. A lot of drugs available in the market are not relevant. There are too many formulations. His policy would be to avoid needless and hazardous drugs.

The petroleum and chemicals minister said that the drug industry has achieved good results in the international market with exports touching about Rs. 400 crores. He would like the exports to go up to Rs. 1,000 crores by the end of the Eighth Plan.

The multinationals and the big units must start manufacturing more and more bulk drugs and intermediates in the country. They have been neglecting sectors by producing formulations.

Mr. Gurupadaswamy was, however, highly critical of the attitude adopted by the drug units with regard to recovery of arrears from them for overcharging,
in terms of the Supreme Court j
ment.

He said, "it was not my decision
drug units, themselves, went to
Supreme Court which gave a judge
in favour of the government and a
it to recover the amounts.

"Now the drug units do not wa
pay the amounts. They want the
ernment to allow the arrears to be
off against the increases in prices w
according to them are due after 1

"But, this is not permitted under
law. The law does not allow for s
set-offs. I cannot violate the Supre
Court order. The amount has to
recovered. The previous governm
may have been sitting on it and fa
in its duty... but, I am responsible to I
liament and to the people", he sa
"There can be some difference of op
ion on the amounts to be recovered.
have issued notices and they can sup

DIAM ORGANIC CHEMICAL INDUSTRIES (P) LTD.

*Manufacturer Offers (Ex-Stock)*

GLYCOL ETHERS

ETHYL CELLOSOLVE

ETHYL CARBITOL

ETHYL TRIGLYCOL ETHERS

Contact:

*Bombay Office:* Crescent Chambers, First Floor, Tamarind Street, Fort, Bombay 400 023.
**Tel: 272341, 276239, 272339**
**Tlx: 011-85644 TAPS IN**
**Cable: 'CHERRY', Bombay 400 036.**

he data which can be examined. But, y want set-offs to be allowed and are ling me too rigid. They say I am sit- g over files. But, they do not realise t while in some cases price revisions y be upwards after 1983 resulting in ne gains for them but in other cases revisions could be downwards. I ve so far not asked for arrears for the riod beyond 1983. But the arrears uld also be applicable to period upto 87."

Mr. Gurupadaswamy said that he has eared some of the files giving reliefs certain cases. However, he has to take o consideration the interests of the nsumers also. The drug units should t be allowed to exploit the psychology the suffering patients, of the family embers trying to save the patient, natever be cost of the medicines. This nnot be allowed. "The consumers ve been approaching me in this gard. Where will they go? The proach has to be humane and the drug its must respond to it. Ensuring drugs a reasonable price is a commitment the National Front Government."

Referring to the recent criticism ainst measures taken by the govern- ent to curb consumption of petroleum oducts, Mr. Gurupadaswamy said that s worst critics were his best friends nce they help create an awareness out the problem of shortage of petro- um product.

The whole idea was to convey the essage that there was need to conserve etroleum products because of the riegn exchange crunch. "I have been ccused of taking a decision in a haste. ut, I actually delayed the decision by bout two months. I wanted to prepare e public for it. Before announcing the ecision, I spoke about it at several laces.

"If I had not taken the decision now, e might have been forced to go for ationing in December or January. The roblem will have to be faced. In fact, the decision to give a weekly off to petrol pumps had been welcomed at many places. Several petrol pump dealers had been saying there should be a weekly off for them also.

He said, opposition for the sake of opposition will not lead us anywhere. However, he said there is always scope for corrections. "Any suggestions involving growth and development will be good. We have neglected public transport for 40 years and more attention has to be paid to it. But, I cannot be held responsible for it", he said.

About the opposition from the railways to the cut in fuel consumption proposed by the petroleum and chemicals ministry, Mr. Gurupadaswamy said that the railways have not been fully using the electric tracks. They could also use coal. A lot of kerosene is being wasted in cleaning machines. Some substitute should be found for this. Reckless use of kerosene must stop. Mr. Gurupadaswamy said that his approach has been to pursuade different user sectors informally rather than to impose something on them.

He said that measures have also to be found to prevent adulteration of high-speed diesel with kerosene. This adulteration takes place because kerosene is cheaper than diesel. But the kerosene prices cannot be increased since it is the only fuel available to the poor people in many areas. At the same time, diesel prices cannot be increased beyond a certain limit.

Though administrative measures to help check adulteration of diesel with kerosene are being taken, they cannot be fool-proof measures. In the long-run, LPG could perhaps provide the solution though at present it is not possible due to its shortage. The possibility of using of non-conventional energy sources has also to be explored.

The petroleum and chemicals ministry is working on a zero gas flaring programme and a new gas-use policy. A paper for interministerial discussions has also been prepared. Based on the paper, the government will soon lay down the priorities for use of gas for different sector like power, fertilisers and sponge iron.

There is also a proposal to bring the offshore gas to landfall point and take it to the four southern states which are facing power shortage.

About the joint venture Karnal refinery, Mr. Gurupadaswamy said that the project will come up in the Eighth Plan. If the Tatas, the joint venture partner, do not accept the conditions, the project will be taken up by the public sector Indian Oil Corporation.

Asked whether in the light of the poor experience of the government with the Tatas in the Karnal refinery, the government would give up the joint venture approach to such projects, Mr. Gurupadaswamy said that we have an open mind. There is shortage of resources and if someone is interested in bringing resources, we can explore the possibility.

Mr. Gurupadaswamy said that his ministry was ready to push this year, projects worth Rs. 26,000 crores. "However, there is a shortage of resources. Planning Commission is to indicate the resources that will be available for the Eighth Plan. They have their own problems and I can quite appreciate them."

The petroleum and chemicals minister said that his ministry would like to adopt a liberal policy regarding the petrochemicals sector. Several letters of intent about crackers have been issued. However, the government has to take a view on the parameters for allowing the petrochemical units to be set up.

It does not matter whether these units are in the public sector, joint sector or in the private sector.

# Drug industry's fear of price control allayed

The petroleum and chemicals secretary, Mr. M.S. Gill, has described as totally speculative the apprehension of the drug industry that the government wanted to bring maximum number of drugs under price control with minimum markups.

Talking to **The Economic Times** recently Mr. Gill said 'we have so far taken no view on mark-ups to be allowed'. Mr. Gill said that a review of the drug policy was being made since it was part of the commitment of the National Front Government. 'Our view has always been that the people must get an adequate supply of quality drugs at reasonable prices', he said.

For this purpose, the ministry is holding discussion with various sections. "There is a standing committee on drugs. Discussion have also been held with the health ministry and various organisations of industry and trade. The petroleum and chemicals minister, Mr. M.S. Gurupadaswamy, has personally heard the most severe criticism from the industry. The whole idea is to get the best possible views from wherever they are available. All these will be taken into account when the proposals are finalised by the ministry", Mr. Gill said.

These proposals will be put before the commitee of secretaries and the cabinet committee on economic affairs for a decision. Mr. Gill said that today the drug industry has a production of about Rs. 3,500 crores per year. In the Ninth Plan, it is needed to take the production to Rs. 16,000 crores. This would mean a quantum jump in production. This has to be kept in mind and the growth of industry ensured.

Exports of drugs, Mr. Gill pointed out, are playing a vital growing role. Last year, the exports amounted to Rs. 843 crores which was a 80-per cent increase over the previous year. These exports are being made to hard currency areas like the U.K., USA, Japan, West Germany and Switzerland. The policy must encourage higher exports, he said.

Mr. Gill said that it was important to encourage production of drugs in the country from the basic stage. It was also important to encourage worthwhile research and development in the country. At present, the industry was spending only about one per cent of the turnover on research and development. The ultimate aim should be spend about eight per cent of the turnover on research and development. The country has to face these long-term objectives, Mr. Gill said.

He said that everyone must understand and have a constructive approach to enhance production, quality and availability of drugs at reasonable price. Instead of looking for criticism, the effort should be to find collective, reasonable and appropriate solutions.

Mr. Gill also clarified that the meeting of the state drug controllers held in the petroleum and chemicals ministry was part of the series of meetings the ministry is holding with various organisations concerned with the drug policy. The state drug controllers gave their views on various policy parameters and the overall working of the current drug policy. They offered suggestions for the improvement, of the policy in relation to growth of the industry and for protection of the interests of the consumers. The state drug controllers also gave their views with regard to the Drug Prices Control Order and its implementation.

The existing mechanism for monitoring of shortages was reviewed and it was found that the system was working satisfactorily. All the state drug controllers were unanimous on the need for strengthening of the drug control administrations all over the country.

The need for upgrading the t and quality control facilities in va states was also emphasised.

---

## HITECH PRODUCTS FROM ISREL

Israel has invited Indian industri and traders to visit their countr exploring the enormous potentia boosting mutual trade and forging ventures. This was announced by S. Ofri, Economic affairs counsell the Israeli Embassy in Singapore du his visit to Bombay. Out of its exis trade of $130 million almost $100 lion is in diamond exports. Trad other products is negligible, comp to the prospects.

Soome of the area where trade ca developed are:

1. Telecommunication: fibre opt automatic scanners.
2. Medical instrumentation: MR ECG equipments, diagnostic kits
3. Robotics & CNC.
4. Computer graphics.
5. High power industrial lasers
6. PCB inspection systems, CAD/CA
7. Computerised & drip irrigation s tems.

In the chemical industry the appears to be substantial scope expanding trade. Presently trade fro Israel is approximately $10 to $15 m lion.

Good opportunities exist in the fie of:

a. Bromine compounds
b. Agrochemicals
c. Industrial chemicals

Israel has also developed a techno ogy for making phosphoric acid fro phosphate and hydrochloric acid and n the traditional sulphuric acid. This coul be of interest to our fertiliser units. Mor information can be had from: Isra Consulate, "Kailash", Peddar Roa Bombay - 400 026.

# GSFC poised for balanced growth

The Gujarat State Fertilisers Corpor- on (GSFC) is poised to make an vestment of about Rs. 1,800 crores ver the next three years, according to r. H.R. Patankar, its chairman and anaging director.

Mr. Patankar, in an interview to The **conomic Times,** said that the strategy ow was to evolve a balanced growth attern involving a mix of fertilisers and dustrial products in equal proprtions. he new investment would be made in xpansion and diversification of the SFC's activities and would include ncreasing the capacity of its 20,000 onnes a year caprolactam plant, the set- ng up of a 1,350 tonnes a day ammonia lant at Baroda, a phosphoric acid plant, referably in an African country, the xpansion of its melamine unit and xpanding cogeneration of power in col- aboration with some other units located n Baroda.

Some of the project proposals, such s the expansion of caprolactam plant's apacity immediately by 50,000 tonnes year and later again by another 50,000 onnes and that of locating a new ammonia plant received a thrust in the past four months after Mr. Patankar, a former chief secretary to the Gujarat Government, took over as chairman and managing director.

The GSFC will press for an allocation of an extra supply of 21.5 lakh cubic metres of gas per day as feedstock for its ammonia unit. Of this, 17 lakh cubic metres of gas a day is needed for the new ammonia project while 4.5 lakh cubic metres for an existing plant. The company gets 4.5 lakh cubic metres of gas at present.

In caprolactam capacity addition, the GSFC seemed to be running ahead of other contenders wanting to enter the field. There were two other letters of intent with parties in north and east India, but Mr. Patankar felt that with the experience gained in the manufacture of caprolactam and in view of the fact that already one expansion programme was on, the company would be able to go ahead more easily than others. By 1994-95, the total capacity for caprolactam at the GSFC would be as much as 1.20 lakh tonnes, capable of taking care of the country's projected demand by then.

Mr. Patankar said that the GSFC's coastal DAP unit, at Sikka in Saurashtra, was based on imported phosphoric acid and ammonia. In the last two years, the government's canalising agency had not been able to get imported phosphoric acid, resulting in prolonged closure and cash loss of Rs. five crores. The Sikka plant had been for the past two months operating at 1,700 tonnes DAP capacity, he said. The GSFC, Mr. Patankar said, had decided to put up its own phosphoric acid plant with a capacity of 2.5 lakh tonnes a year at a cost of Rs. 300 crores. The company was exploring prospects for locating it in Togo, in Africa, where rock phosphate was found in abundance.

It also wanted to acquire one or two ships to transport its phosphoric and sulphuric acid requirements, the chairman said. A decision was being taken now to set up a modern ammonia plant with a capacity of 4.40 lakh tonnes a year at Baroda at a cost of Rs. 400 crores. At present, the company has an ageing ammonia plant producing 3.45 lakh tonnes a year.

Mr. Patankar said the GSFC was also keen on expanding its 5,000 tonnes a year melamine plant, the largest in the country now, by adding another 10,000 tonnes a year capacity at a cost of Rs. 80 crores. The present melamine unit had been operating at 100 per cent capacity.

The company, which at present has two sulphuric acid units of 2.87 lakh tonnes a year capacity together, wanted to expand the capacity by adding another three lakh tonnes a year at a cost of over Rs. 30 crores. Mr. Patankar said that although some 80 per cent of the melamine needs of the country were being met by the GSFC, there was a rise in its demand.

The company had urged the government to give it a licence for importing 1,500 tonnes of melamine per year to tide over the temporary shortage, till its' expanded capacity became available. The government had allowed it to import 750 tonnes of melamine a year so far.

The company also wanted the government to reduce the basic duty from 70 per cent to 30 per cent, and auxiliary duty from 50 per cent to 30 per cent with the countervailing duty remaining the same at 15.75 per cent, to arrive at a weightage price of Rs. 56,000 per tonne, a reasonable price, he added.

The GSFC, along with the Indian Petrochemicals Corporation, Petrofils, Gujarat Alkalies and Chemicals Ltd., and Gujarat Electricity Board, has set up the Gujarat Industries Power Company with an outlay of Rs. 200 crores. It will generate 135 MW of electricity, of which about 40 MW will be available to the GSFC. The GSFC has also commissioned first and second phases of cogeneration plant for steam and power at a cost of Rs. 71 crores, with a capacity to give 40 MW. Mr. M.S. Gurupadaswamy, union minister of state for petroleum, had visited Baroda recently and the GSFC management further pressed him for its demand for additional gas allocation.

Mr. Patankar said that the Gujarat State Fertilisers Corporation, which has for several years now been considered a blue-chip company, had started diversification right from the late sixties and commissioned the country's first caprolactam plant in 1974. Later engineering plastics, laminated plastics, acrylics and industrial gases were added to the GSFC's range of activities

**ESTD: 1969**

For Your Requirements Of:

PARA TOLUENE SULPHONIC ACID

(P.T.S.A. -- 98%-99%)

PLEASE CONTACT MANUFACTURERS

**REENA CHEM**

**Regd. Office & Factory:**
C/3/15, GIDC Estate,
Nadiad, Gujarat-387 001
**Phones: 4661/4383**
**Cable: "CHEMSTICK"**

**Bombay Office:**
1106, Maker Chamber V,
221, Nariman Point,
Bombay - 400 021.
**Phones: 240842/225118**

---

For your requirements of:

* REACTIVE TURQUOISE BLUE H5G
* REACTIVE TURQUOISE BLUE 2DX

*Marketed by:*

**M/s. DIPEE CHEMICALS PVT. LTD.**

102, Sarvodaya Commercial Centre, Salapas Road, Near GPO, Ahmedabad 380 001.
**Phone 23940**

*Manufacturers:*

**M/s. SPARKEM**

ANKLESHWAR (GUJARAT STATE)

(KNS-ADI)

---

For your requirements of

AMMONIUM BIFLUORIDE
AMMONIUM FLUORIDE
AMMONIUM FLUOBORTE
SODIUM BIFLUORIDE
SODIUM FLUORIDE
SODIUM SILICO FLUORIDE
SODIUM FLUOBRATE
SODIUM CRYOLITE

POTASSIUM BIFLUORIDE
POTASSIUM FLUORIDE
POTASSIUM FLUOBORATE
POTASSIUM SILICO FLUORIDE
POTASSIUM TITANIUM FLUORIDE
CHROMIUM CARBONATE
CHROMIUM FLUORIDE

**Please Contact Manufacturers**

**RAJ FLUORINE & CHEMICALS**

D-6, Simit Shopping Centre, Char Rasta, G.I.D.C., Vapi - 396 195 (Guj)
Tel: 1419 Resi: 2030

# IC allowed to participate in Jordan plant

e Southern Petrochemical Indus- Corporation Limited (SPIC), a fer- r giant in the joint sector in Tamil 1, will put up a joint venture in an to manufacture phosphoric acid.

ne government of India has oved the $100-million project with pacity to produce 2,08,000 tonnes hosphoric acid per annum.

PIC's equity investment in the pro- will be 60 per cent with manage- t control and the balance 40 per cent cribed by the Jordan Phosphate es Company and Iraqi sources.

he Centre has also approved a buy- guarantee for the entire phosphoric production. After the project's suc- sful completion, SPIC would have direct benefit of ensuring copious continuous supply of phosphoric which in turn would ensure its DAP ammonium phosphate) production at dras in an uninterrupted manner, the C press release giving the working ults said.

The company would shortly ounce the mode of financing this ject it said. The board of SPIC which t at Madras on 30th July, under the v chairmanship of Mr. M.M. Rajen- n, Tamil Nadu chief secretary, rec- mended maintaining the dividend at per cent for the 12-month period ded March 31, 1990.

The proposed dividend will absorb . 5.44 crores. In addition a preference vidend at 12.5 per cent has been pro- sed for Rs. 86.61 lakhs. For the -months period in 1988-89 the com- ny paid 20 per cent (Rs. 6.8 crores) hich came to 16 per cent on an annu- sed basis.

The company has achieved a record oss profit of Rs. 103.32 crores last ear (Rs. 87.50 crores). After providing r depreciation Rs. 18.04 crores s. 26.91 crores), interest Rs. 45.79 crores (Rs. 59.5 crores) and taxation Rs. 60 lakhs (Rs. 3.25 crores) the net profit was an impressive Rs. 23.07 crores (Rs.. 13.86 crores).

The sales turnover of SPIC and other associate concerns touched an all-time higher level of Rs. 812.42 crores (Rs. 661.28 crores). On an annualised basis, the turnover went up by 54 per cent and profit after tax by 108 per cent. The amount brought forward was Rs. 1.97 crores (Rs. 3.11 crores).

After providing for investment allowance reserve Rs. 4.7 crores (Rs. 5 crores), debenture redemption Rs. 4 crores (Rs. 2 crores) and general reserve Rs. 1.75 crores (Rs. 1.20 crores), the surplus fund available for appropriation is Rs. 8.29 crores (Rs. 1.97 crores).

The dividend announcement as well as financial allocations indicate the management's desire to conserve more reserves for taking up new projects and raise funds from the market.

During the year under review, the company had achieved commendable results in fertiliser production despite the problem it faced in the supply of phosphoric acid and ammonia. Capacity utilisation was 94 per cent in respect of ammonia, 104 per cent in respect of urea and 77 per cent in DAP. DAP sales at 10.81 lakh tonnes was an all-time record achieved by the company.

The acquisition of the caustic soda plant from the Kothari group proved a prudent decision with the unit fetching copious profits by wiping out all the cash losses.

The shipping division had equally fared well earning a foreign exchange of Rs. 14.48 crores. SPIC had placed an order for 22,500 cub.m capacity modern gas carrier with Hyundai Heavy Industries, South Korea and the vessel is expected to be delivered during end of the next year.

---

## NFL NEW SCHEMES TO COST Rs. 1,400 CR.

National Fertilisers Ltd., (NFL) has envisaged implementation of various schemes during the Eighth Plan, involving an estimated outlay of about Rs. 1,400 crores.

The plans are under consideration of the Government. The company's proposal for doubling the capacity of its Vijaipur plant and installation of a nitro-phosphate plant at Nangal are already under consideration.

Other schemes proposed by the company are expansion of the Panipant plant,, argon gas plants at Nangal and Panipat/Bhatinda, methanol plants at Bhatinda and Panipat and other revamping and retrofitting schemes, according to an NFL spokesman.

National Fertilizers Limited has set up an all-time production record during 1989-90, by producing 10.4 lakh tonnes of 'N' with a capacity utilisation of 100.6 per cent. This registers an improvement of 11.4 per cent over the previous year.

All four plants of the company have achieved high levels of performance. The Nangal unit achieved capacity utilisation of 96.4 per cent, Panipat unit 93.4 per cent, Bhatinda unit 95.2 per cent and Vijaipur unit 112.3 per cent. In terms of total production during the year, 20.7 lakh tonnes of urea and industrial nitrogen of 29287 tonnes were produced.

The company distributed 21 lakh tonnes of fertilisers during the year and achieved a sales turnover of Rs. 769 crores, which includes Rs. 39 crores, on account of sale of industrial products. The operating results of the company indicate a gross profit of Rs. 148.60 crores, before interest and depreciation which is also the highest gross profit ever achieved

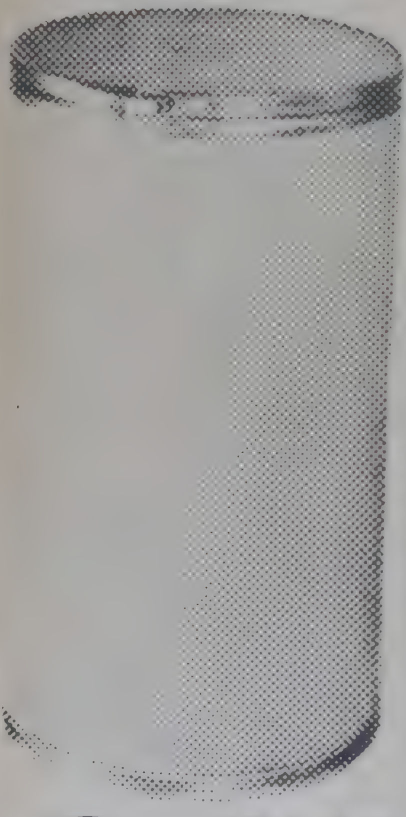
**Atlas Fibre Drums**

- Are light in weight.
- Low tare weight reduces transportation and handling costs. Ideal choice for export packaging.
- Keeps your products safe from contamination, fungus, moisture and corrosion because the packaging material is inert
- Can withstand impacts and jolts.
- Are designed for stability.
- Strength/Weight Ratio is high if stacked upright.
- Can be conveniently stacked
- Lid can be fully opened to allow easy filling or emptying
- Locking system prevents pilferage
- Surface suitable for Printing/Stencilling for product identification. Varnish and Waxing provided on specific orders

**Used For :**

- Basic drugs. Drug intermediates and Pharmaceuticals
- Chemicals and Allied Products
- Food Products.
- Cattle/Poultry feeds/drugs.
- Plasticizers and Resins.
- Dyes and intermediates.
- Pesticides
- Engineering Goods and Foundry Flux.
- Soaps and Detergents.
- Metal Powders.

RANGE
DIAMETER :
10" to 20"
HEIGHT :
6" to 44"
CAPACITY :
7 Lit. to 225 Lit.



**ATLAS FIBREPACK INDUSTRIES**
NEAR GRID STATION INDUSTRIAL AREA.
ODHAV,AHMEDABAD-382 415.
TEL.: 368436-368437.GRAM : ATLAS DRUMS
TLX.: 0121-6677 ADCI IN

Kruti Comm

**USE QUALITY ATLAS FIBRE DRUMS**

---

**Unichema International**

(UNILEVER GROUP)
West Germany/Holland/U.K./Australia/Mala
OFFERS:

for COSMETIC INDUSTRY
n-Butyl Stearate
Glycerol Mono Stearate
Isopropyl Myristate
Isopropyl Palmitate
Propylene Glycol Dicaprylate
Glycerol Tricaprylate
Stearic Acid

for PERFUMERY INDUSTRY
Glycerol Triacetate
Glycerol Diacetate
Diethyl Phthalate
Iso Propyl Myristate

for FOUNDRY MOULDS & CORES
Ethylene Glycol Diacetate
Glycerol Triacetate
Glycerol Diacetate
Glycerol Mono-Oleate

For imports into India and further details
Please Contact:
**AGENTS IN INDIA**

soofi enterprises

1317, Dalamal Tower, 211, Nariman Point,
Bombay 400 021.
Tel. Nos.: 224689/233074
Tlx. No.: 0118-4187 SUFI IN
Cable: SOOFICHEM
Fax No.: 2047657

# International seminar on chemicals & pharmaceuticals

three day international seminar on micals and pharmaceuticals, held at shna Oberoi Hotel, Hyderabad from h to 21st July, focussed attention on recent developments and export portunities in the chemical, pharma- tical and allied industries. The confe- ce was organised by M/s. Network nsultants, Hyderabad. Leading lum- ries of the industry from all parts of ia and foreign Government trade rep- entatives participated in the delibe- ions.

The conference was inaugurated Mr. Ramachandra Reddy, Speaker of the dhra Pradesh Assembly. Mr. M.V. jeshwar Rao, Managing Director of rup Synchrome Ltd. welcomed the ef guest and others. Dr. A.V. Rama o, Director, Indian Institute of Chem- l Technology, Hyderabad delivered key note address. Mr. M.S. Murthy dustrial Advisor to the Ministry of hemicals and Petrochemicals, Gov- nment of India spoke on the chemi- l and pharmaceutical industries in the n plan period. Earlier Mr. A.S. Bose, anaging Director of M/s. Network onsultancy Services (who had organ- eds the event) gave an introductory eech.

An exhibition of chemical and phar- aceutical machinery was also held at e Institution of Engineers where about forty manufacturers of machinery, instruments and systems displayed their wares.

In his welcome address, **Mr. Rajeshwar Rao** introduced the chief guest, Mr. Ramachandra Reddy, who had over thirty years of association with the industrial activities of Andhra Pradesh. Mr. Reddy was the chief architect of the famous Patancheru Industrial Estate in Medak district. "The chemical industry is growing very rapidly and contributing handsomely to the country's progress. It is therefore, appropriate that the seminar of this nature is organised. The response to the seminar is excellent as more than 500 delegates have come here to participate. Mr. Bose is to be congratulated for organising show of this magnitude", Mr. Rao said.

In this speech, the Director of IICT, **Dr. Rama Rao** gave an excellent account of the present scenario of the chemical & pharmaceutical industry and the developments that are likely to take place in the coming decade. He said that the Indian pharmaceutical industry had come of age in not only fulfilling the country's needs but also exporting substantially. Dr. Rao commented that despite the progress made by the various segments of industry, most of the work done had been in the field of development work and not much in basic research. Are we really satisfied with the current trend, he querried. Of the 900 patents that are with the Department of Science and Technology, nearly 250 patents related to the chemical and pharmaceutical industries. "In the name of Research & Development, only developmental works are being carried out", he said. Further the quantum of research by companies was negligible being less than 2% of turnover. He lamented that the R&D laboratories of multinationals and big industries hardly carried out any basic research of note. On the other hand there are various Government laboratories, institutes and the C.S.I.R. laboratories where some basic research works are being carried out. Even here the research is focussed on solving the immediate needs and problems, he said.

Regarding exports, Dr. Rao said that even though exports have been good, the export of value added products were minimum. There is a wide scope for manufactured goods instead of processed ones. The scope is unlimited, he said, owing mainly due to patent law changes and governments policies.

The dyestuff industry has been doing well in the export front. In pesticides, a number of organo phosphorous pesticides are being exported. There is still wider scope for export of more pesticides. Touching upon pollution, Dr. Rao opined that small scale industry does not have resources to put up effluent treatment plants. They should all concentrate at one place where common plants could be set up. It is imperative that pollution and safety aspects had to be adhered to. In this connection, Dr. Rao pointed out that the industries must come up in remote and backward areas where population is meagre. This is particularly true to the chemical industry.

**Mr. M.S. Murthy,** Advisor to the Ministry of Chemicals & petrochemicals, Govt. of India, gave a detailed account of the progress of chemical and

INTERNATIONAL SEMINAR
ON
CHEMICALS & PHARMACEUTICALS INDUSTRIES

**rom (L to R) Mr. A.C. Bose, Managing Director, Network Consultants; Mr. M.S. Murthy, Advi- or, Ministry of Chemicals; Mr. Ramachandra Reddy, Andhra Govt. Assembly Speaker and r. A.V. Rama Rao, Director, I.I.C.T.**

pharmaceutical industries in the 8th Plan period. He said the industry is almost self sufficient in meeting domestic needs. There has also been significant increase in exports. While planning for the 8th Five Year Plan emphasis has been laid to increase the average growth rate. The industry should improve productivity and quality and reduce the price in order to be competitive in the international market. The cost of effluent treatments would also come down if the raw materials are produced efficiently and with enhanced productivity.

Mr. Murthy urged the manufacturers to modernise their plants. Since oil reserve is limited, one should look into more energy conservation. Unfortunately in India, the power is heavily subsided. In the 8th Plan, emphasis has been given to energy conservation schemes which would also reduce the greenhouse effects. Another aspect Mr. Murthy touched upon was water conservation. "Water is no more a free commodity", he continued. Mr. Murthy called upon industrialists to think of water conservation and take appropriate measures to reduce water pollution. He regretted that the R & D expenses was only 1% to 2%. It should atleast go upto 5% per annum. "It is the research and developments activities that would accelerate the growth", he said.

### Chief guest Mr. Ramachandra Reddy's Speech

Inaugurating the seminar, the Andhra Pradesh Assembly Speaker, Mr. Ramachandra Reddy, noted the excellent progress made by the chemical industry during the last two decades. The country is self sufficient in its need of chemicals and pharmaceuticals. Government of India has recently come out with the Perspective Plan for the Chemical Industry-2000 A.D. Various measures have been spelled out to boost the exports.

There is an urgent need to give further fillip to the industry to achieve greater exports. Both chemical and pharmaceutical sectors directly contribute to the welfare of the nation. Mr. Reddy recalled his three decade's association with the industry as the Chairman of the Andhra Pradesh Industrial Development Corporation. He cited the "Patancheru Industrial Estate" where the large, medium and small scale industries thrived. There is a serious imbalances between the developed and under developed estates. He suggested the setting up of growth centres for each district.

Apart from dispersal of industries, the speaker drew the attention of the audience to the need for pollution control measures right from the inception stage. Even in the existing industries, the entrepreneurs should adopt pollution control measures. After the Bhopal incident, people have become environment conscious. Therefore the newly coming up industries should adopt appropriate measures to include pollution control costs in their overall estimate.

As far as the existing industries are concerned, there should be mutual cooperation between the industry and other Government bodies like Andhra Pradesh Development Corporation and Pollution Control Boards to reduce the pollution and wherever possible financial assistance should be provided.

Regarding Research and Development Mr. Ramachandra Reddy said that some of the national research institutes were doing excellent research work which were effectively utilised by some of the industries. However, it was important that the industries should also allocate sufficient funds for their own research and development. Only profitable collaboration between the industry and research institues would lead to betterment of our society. He expected the deliberations of the seminar to find solutions to some of these basic problems.

### SESSIONS

The three day seminar was divided into the following sessions.

### *Foreign collaboration and expo*
### *opportunities*

**Mr. M.C. Bhat,** Joint Secr
Ministry of Chemicals presided ov
proceedings. **Mr. Umesh Sal**
Chief Executive, Bajaj Capital In
ment Centre Pvt. Ltd., Delhi pres
a paper on "Technology Transfer
Collaboration Arrangements".
pointed out that there were plen
foreign journals which gave lo
details about technologies available
also said the Indian Entreprer
should make use of the patents w
would expire shortly, Reseach stud
in foreign universities did exce
research work in the chemical
pharmaceutical fields. Their w
could be utilised profitably by the In
manufacturers. **Mr. Michal Roitm**
Trade Commissioner of France sp
on the opportunities of mutual coo
ration between India and France.
gave a short account of the Fre
chemical industry. Briefly Mr. Roitr
dealt with the international strategy
the French firms, French oriented r
tions and the exports from India
France. **Mr. Arun Sehgal,** Commer
Officer, Canadian Consulate and M
**R.P. Samuel,** Senior Commercial Ad
sor, Swedish Embassey, New De
spoke on the export opportunities ava
able in their respective countries. M
**Heaning Chemnitzer,** Anlagenba
GMBH presented a paper on the deve
opment of chemical industry and expo
potential and areas where mutual coo
eration could be considered.

### *Inorganic chemicals and fertilizers ar*
### *organic intermediates*

Dr. A.V. Rama Rao presided ove
this session.

**Prof. M.M. Taquikhan,** Directo
Central Salt & Marine Chemical
Research Institute, Bhavnaga
presented an excellent review paper o
new chemicals from sea water. He laid
emphasis on the development o
ceramic materials which were assuming
greater importance. Prof. Khan also
reviewed the recent developments i

oralkali industry.

**Ir. Arun Hardikar,** Manager ernational) of Hico Products, iewed the present scenerio of indual and export opportunities with parular reference to organic ermediates. He informed the gather the various steps taken by the Govment to give a boost to exports. Mr. rdikar also suggested various steps to omote organic chemical export.

**Mr. Ashok Kadakia,** Chairman and anaging Director of M/s. Ashok ganic Industries Ltd. reviewed the esent status of the alcohol based emical industry. He envisaged that the chohol based chemical industry in dia had the capacity to compete in orld markets. Despite the various conaints and hurdles, this chemical indus had survived and was steadily ogressing.

*rugs and pharmaceuticals*

**Dr. A.V. Rama Rao** who presided er this session also spoke at length on e present scenerio of drugs & pharaceutical industry. He said there were vo or three aspects of the basic drug dustry, one is synthetic drug industry here lot of tonnage of materials are roduced. Many sophisticated drugs, nalgics, beta blockers etc. are being roduced today. We have enough experse in this field. Many items are being ponsored in our research laboratories. Iowever we are lagging behind in fernentation technology. There appears to e a large gap existing. For the drug industry, opportunities lie in (1) the export f drug technology, (2) setting up manfacturing units abroad, (3) export of ulk drugs and formulation to countries aving same patent laws, (4) export of elected bulk drugs.

Dr. Rao said that in the years 1994 and 1995, many important patents for drugs such as cimetidine, terpataline, labetalol, carboplatin, pentoxifylline and captropil were expiring. The Indian manufacturers should start thinking of producing these in advance so that with the expiry of these patents, our products would be ready for export. He also spoke of the chiral drugs, drugs which have mirror image molecular structure.

**Mr. Y.H. Gharpure** of Gharpure Associates traced the growth of the pharmaceutical industry in India and world. He said the investment in this industry was Rs. 240/-million in 1952 which has now grown to Rs. 8,000 million in 1989.

Inspite of the progress, India has one of the largest number of TB, leprosy patients in the world. The per capita consumption of the drugs is low. India produces only 1.6% of the drugs & formulations of the word. There are as many as 22 companies in the world whose turnover is more than the total production in India. Even to achieve this, there are more than 10,000 formulators in India, he regretted.

**Mr. Vinoobhai U. Shah,** former IDMA President said in his paper that in order to achieve the 8th Plan target of producing drugs worth Rs. 16,000 crores and to create "Health for All by 2000 AD", India needs massive expansion of production capacities. This calls for various pragmatic solutions by the Government. The research institutes should be provided with massive funds to go in for intensive research in developing new drugs. Above all, this vital sector ie. the pharmaceutical industry, should be given priority to grow and thereby stabilise their economy with an emphasis on SSI sector.

**Dr. M.D. Nair,** Excutive Director SPIC Ltd., Madras presented an absorbing paper on export opportunites for the pharmaceutical industry. He said that while the export of formulations has stagnated over the last 3 years, the export of bulk drugs have captured international markets. Examples include Ibuprofen, metronidazole, methyl dopa, naproxen etc. It has been estimated that during nineties, export of bulk drugs would go up to Rs. 800 crores. However, Dr. Nair cautioned that exports for export sake without consideration of economic viability could be counterproductive in the long run. "Our technological strengths and ingenuity in assessing market trends and speedy implementation of projects will stand our industry in good stead in the international market place" he said.

The second session on Pharmaceutical was chaired by **Prof. B.W. Dhawan,** Director, Central Drug Research Institute, Lucknow. He also presented a detailed study on the recent developments in the drugs scene with particular reference to the research and developments work done at the CDRI.

**Mr. I.A. Modi,** Managing Director of Cadilla Laboratories Ltd. and Mr. **Avinash Marathe** of M/s. Saiba Industries Pvt. Ltd. presented papers on the export opportunities of the pahrmaceutical industries.

*Cosmetics, perfumes, flavours and agro chemicals*

**Mr. Atul Tandon,** Managing Director, J.L. Morrison (I) Ltd., Bombay chaired this session. He also spoke on the policies and perspectives of the cosmetics industry. Narrating the current problems of the industry, Mr. Tandon said the high taxation, low international competitiveness and spurious products are some of the major hurdles. He also suggested many policy changes for healthy growth of the cosmetic industry to Rs. 2,060 million by 1994. He lamented the low R&D efforts in this sector.

**Dr.U.T. Bhale Rao,** Deputy Director, Indian Institute of Chemical Technology, Hyderabad presened a review paper on the research works that are being carried out at the IICT.

**Mr. Salil Singhal,** Managing Director. Pesticides India Ltd. and Chairman of the Pesticides Association of India gave a talk on the current trends of pesticide product marketing. He was glad to note that the India's ability to develop indigenous technology for a number of pesticides without resorting to imports.

**Dr. Akthar Hussain,** former Director of Central Institute of Medicinal and Aromatic Plants, Lucknow presented a paper on recent devleopments in the technology of production of natural essential oils in India. Because of its wide variety of climate and soil, India is one of the few countries of the world where all the major essential oils are produced. He reviewed the current status of the Lemongrass oil, Java Citronella, Palmrosa, Vetiver, Japanese mint, Peppermint, Spearmint, Lavender, Rose oils etc.

**Mrs. Padma Varadan,** Director, V.V. Deepa Aromatics Pvt. Ltd., Bombay, traced the history of the fragrance industry. She said one of the main hurdles of the Indian aromatic industry was the costlier start-up raw materials used. Big perfumery manufactures abroad are reluctant to offer collaboration to us for fear of losing their monopoly position in advanced technology. She suggested various measures to help the growth of this industry.

**Mr. Avinash Marathe,** President of Perfumes & Flavours Association of India gave a speech on the present scenerio of the perfumes industry and the useful work that is being done by the Association. He also gave a short account of the research done by his firm. He lauded the works of Indian blenders who are doing excellent work on imported aromatic chemicals.

### *Dyestuffs & dye intermediates*

**Mr. K.R.V. Subrahmanian,** Managing Director of Colour-Chem Ltd. presided over this important session. He also reviewed the prospects and problems of the dyestuffs industry. He lamented that though the industry had tremendous growth potential, its progress was systematically being decimated by lack of planning, ill conceived policies, misplaced priorities and its own inherent inability to bind together and act in concert for the greater good of the country. He pointed out that in Germany four big units produce 1,25,000 tonnes of dyestuffs whereas in India there are 900 units whose combined production is just 36,000 tonnes. Mr. Subrahmanian called for establishment of a separate development council for dyes and intermediates.

**Dr. N.R. Iyengar,** of National Chemical Laboratory, Poona presented a detailed paper of some of the recent developments in newer dyestuffs and intermediates. Particularly, he mentioned the research works that are being done in replacing carcinogenic intermediates with new safe products.

**Mr. M.V. Rajeswar Rao,** Managing Director of M/s. Nirup Synchrome Ltd., Hyderabad, spoke on the dynamics of the dyestuffs industry exports. He presented may slides to emphasise the export potential of the industry. He spoke at length of the strengths, weaknesses of the industry and also various incentives and government support that were urgently needed to aid the growth of dyestuffs exports.

**Mr. B. Rajagopal,** General Manager Marketing, The Atul Products, gave an excellent profile of dyestuffs and intermediates. Tracing briefly the history of synthetic dyes in India, Mr. Rajagopal presented figures for the perspectives of the industry. Trends of consumption in India and abroad, export potential and the hurdles in achieveing greater exports were some of his main points.

**Mr. J.B. Patel,** of Entrepreneurship Development Institute of India, reviewed the international scenario for dyestuffs exports. He gave detailed accounts of the status of dyestuffs industries in various countries. Given necessary incentives it is possible for the industry to emerge as an important thrust area on the export front in coming years. Mr. Patel also wa more exports of inorganic dyes as are more labour intensive and likel find greater export market.

## SPECIALITY CHEMICALS

**Mr. O.P. Nangia,** Adviser to Hin stan Organic Chemicals, chaired session. He also presented a paper the recent technological developme in the speciality chemicals sector.

**Dr. Kishan Kumar,** Chief Chem ONGC spoke on the development oilfield chemicals in India and th export potential. He listed out many c field chemicals that were once impor and that are now being exported. Duri the last decade a major breakthrough the production of oilfield chemicals h taken place. Even agro based produ required for oil industry now provi export opportunities, he said.

The last day of the seminar featur sessions on pollution and safety ma agement, foreign collaboration a investment policies, export policies a opportunities. A number of experts various disciplines presented inform tive papers on the above subject.

---

## LIST OF EXHIBITORS AT THE CHEMICAL & PHARMACEUTICAL MACHINERY EXHIBITIO

Virchow Drugs Pvt. Ltd., Plot No.
& 6, S.V. Co-op. Inds. Estate, I.D.A
Jeedimetla, Hyderabad 500 855.

Durametallic (India) Ltd., 163, Roa
No. 1, West Marredapally, Secunder
bad 500 025. Regd. Off.: Madras.

Laboratory Services, No. 5, 9th Cro
Street, Karpagam Gardens, Adaya
Madras 600 020.

The Bombay Company Ltd
5-10-188/1, Hill Fort Road, Hyderaba
500 004.

Chemito Instruments Pvt. Ltd., 5-9
88/1, Gr. Floor, Saphire Bldg., Fate
Maidan Road, Hyderabad 500 001.

Ranbaxy Laboratories Ltd., Pharma- utical Division, Okhla, New Delhi 0 020.

Gujarat Machinery Mfrs. Ltd., 311, inoy Trade Centre, Secunderabad 0 003.

United Agro Engg. Pvt. Ltd., 147, P. Road, P.O. Box 2159, Secunder- ad 500 003.

Goel Scientific Works Pvt. Ltd., /35, Sardar Estate, Ajwa Road, aroda 390 019.

Arctic India Sales, 12-13-125, 1st oor, 3rd Street, Tarnaka, Hyderabad 00 007.

Hrishikesh Indl. Fabrics Pvt. Ltd., )-B, Shivam Estate, Subhas Lane, alad (East), Bombay 400 097.

Scientific Apparatus Manufacturing o., 255/3-C, Mangaldas Bldg., Man- aldas Road, Bombay 400 002.

Synthokem, P.B. No. 1911, B-5, dustrial Estate, Sanathnagar, Hyder- bad 500 018.

Safety Services, 5, Rajniketan-A, .V. Road, Opp. Polychem Ltd., Gor- gaon (West), Bombay 400 062.

Atic Industries Ltd., Post Atul 396 20. Dist. Valsad, Gujarat.

NETEL Chromatographs, S.V. Road, Ianpada, Thane 400 607.

Punjab Chemicals & Pharmaceuticals td., 8-2-293/A/89, Rd. No. 9, Jubilee Hills, Hyderabad 500 034.

Sartorious GmbH Filtration Division (Overseas), 22 B, Krishna Bhavan, 3rd Floor, B.S. Devshi Marg, Govandi Station Road, Deonar, Bombay 400 088.

Tambi Steel (India) Pvt. Ltd., Tambi Complex, Bajaj Nagar, Tumsar 441 912.

Binzu International, 1502, Maker Chambers V, 221, Nariman Point, Bombay 400 021.

Adair Dutt & Co. (India) Pvt. Ltd., 67-A, Rashtrapathi Road, Secunderabad 500 003.

Neco Group of Industries, F/8, MIDC Indl. Area, Hinga Road, Nagpur 440 016.

Modi Industries (FC) Pvt. Ltd., 85/95-B, Mittal Court, Nariman Point, Bombay 400 021.

A Z Fine Chem Bombay, Through Ambica Chemicals, 7-1-435, Suresh Road, Secunderabad 500 003.

Netech Electronics Pvt. Ltd., 4-1-914, "Mani Manai", Parsi Lane, Tilak Road, Hyderabad 500 001.

Emmar Marketing Services, B-13, Ground Floor, New Bakaram, Gandhinagar, Hyderabad 500 380.

Bolting Enterprises, 121, 1st Floor, Veena Beena Shopping Centre, Turner Road, Near Bandra Station, Bandra (W), Bombay 400 050.

Asia-LMI Pvt. Ltd., TS 75, Ekkadutangal, Madras 600 097.

Mr. Pradip Bhatia, Paks Trade Centre, 8-2-588, Road No. 8, Banjara Hills, Hyderabad 500 034.

Bakelite Hylam Ltd., Surya Towers, 3rd Floor, Secunderabad.

Warden & Co. (India) Ltd, Flat No. E-2, Road No. 15, Wagle Industrial Estate, Thane 400 604.

C.Z. Instruments India (Pvt) Ltd., 1, Arunodaya Society, Baroda 390 005.

India Carbon Ltd., No. 3, 1st Floor, Abids Shopping Centre, Chirag Ali Lane, Hyderabad 500 001.

Saru Chemicals, Andheri, Bombay.

Rashtriya Chemicals & Fertilizers Ltd., P.D. Asurlekas Rashtriya I P D, Bombay 400 022.

Blue Star Ltd., 2-2-47/1108, Balaram Road, Secunderabad 500 003.

Flotrol Engineers, 8-3-169/2, Siddartha Nagar, Hyderabad 500 890.

Vaskar Chemicals, C-18, Indl. Estate, Rourkela 769 004.

Fluid Energy Systems, B-6/2, IDA, Uppal, Hyderabad 500 039.

Sol Pharmaceuticals Ltd., 5-9-88/2, Saphire Bldg., Fateh Maidan, Hyderabad 500 001.

Instruments Corporation & Services, 12-5-149/11/1, Vijaipuri, Opp. NIN, Hyderabad 500 017.

BP · MEKP · TBHP Jain TBPB · DTBP · BP

- BENZOYL PEROXIDE
- M.E.K. PEROXIDE
- T-BUTYL HYDROPEROXIDE
- T-BUTYL PER BENZOATE
- DI TERTIARY BUTYL PEROXIDE
- ALUMINIUM ISOPROPOXIDE

DELHI: RISHABH TRADING CO.
GALI MATKE WALI,
SADAR BAZAR,
DELHI - 6.
Tel: 7532197

CALCUTTA : B. JAIN & CO.
B-20, BAGREE MARKET,
71, CANNING STREET,
CALCUTTA - 1.
Tel: 250276

Contact Manufacturers
**Jain & Jain**
214/A JANJIKAR STREET
BOMBAY-400 003
PHONE
323097 • 321652 • 328765

TBHP · TBPB · DTBP · TBHP · TBPB · DTBP ·

BP · MEKP · TBHP · TBPB · DTBP · ALISOP

Available Regularly Original and Distilled SOLVENTS
at most competitive price

**I.P.A./N. BUTANOL**
**ACETONE/DI ACETONE**
**BUTYL ACETATE**
**ETHYL ACETATE**
**OCTANOL/M.C.B.**
**ANILINE OIL**
**M.D.C./E.D.C.**
**T.C.E.**
**M.E.G./D.E.G.**
**XYLENE**
**TOLUENE/BENZENE**
**PHENOL**

Please Contact:

**GOODEARTH PETROCHEMICAL INDUSTRIES**
**TARUN PETROCHEMICAL**
*Sales Office.* 19, Bhandari Street, 10, Karimji Building, Bombay 400 003.
*Regd. Office:* 156/4, Chandrakiran, Sher E-Punjab Colony, Mahakali Caves Road, Andheri (E), Bombay 400 09
**Phone: 345466, 322829; Resi: 6346603, 6321061**

**WE ALSO PURCHASE WASTE SOLVENTS & PHENOL CRUDE MIXTUR**

---

For Your Requirements Of:

**(A) MICRO-FERTILISERS: (Partially/Fully Chelated)**

POLYMAX (SOIL APPLICATION)
POLYMAX (IDEAL)
POLYMAX (SUPER)
POLYMAX (NPK - 15:15:15)
POLYMAX (LIQUID LEAF SPRAY)
POLYMAX (NPK - 9:9:9 - LIQUID)
ZINCMAX (ZINC-EDTA 12%)
FEROMAX (FERRIC-EDTA 12%)
MAGMAX (MAGNESIUM-EDTA 6%)
COP MAX (COPPER-EDTA 12%)
MANGMAX (MANGANESE-EDTA 12%)
BOROMAX ($B_2O_3$ 30% & Zn 13%)
MOLYMAX ($MoO_3$ 50% & Zn 8%)

**(B) SODIUM BI-CARBONATE BASE**
**DRY CHEMICAL POWDER AS PER IS:4308**
**(C) PULVERISING JOB WORK ALSO UNDERTAKEN**

**Please Contact:**

**SATYAJIT CHEMICALS PVT. LTD.**
**Factory:** Stanny Compound, Khairani Road, Sakinaka, Bombay-400 072. **Tel.: C/o. 580886**
**Regd. Office:** 26, Hanhar Niwas, Besant Street, Santacruz, Bombay 400 054.
**Tel.: 6491621/6493821** **Gram: "CHELASULPH" Bombay 400 054**

---

**CONSUMERS & EXPORTERS!**
**For Your Requirements of:**

**ANALGIN I.P.**
**CALCIUM GLYCEROPHOSPHATE B.P.C.**
**MANGANESE GLYCEROPHOSPHATE B.P.C.**
**MAGNESIUM GLYCEROPHOSPHATE B.P.C.**

*ANY BIOLOGICAL PRODUCTS LIKE:*
BACTO-PEPTONE * PEPTONE PASTE
PROT LIVER EXT. POWDER OR PASTE
LIVER CONCENTRATE POWDER OR PASTE
LIVER FRACTION NF1

Please Contact:

**KOTHARI BROTHERS**
8, Vijay Subh Nivas, 2nd Floor, Pandya Lane, Juhu Tara Road, Bombay 400 049. Phone: 6129890

# CECRI celebrates Foundation Day

The Central Electrochemical search Institute (CECRI) Karaikudi, e of the premier research laborator- in the country, celebrated its' Foun- ion Day on July 25, 1990. A two day ain-storming session on electrochem- ls was organised concurrently in ler to identify thrust areas of research the field of electrochemistry.

Prof. M.M. Sharma, Director, partment of Chemical Technology, iversity of Bombay delivered the undation Day lecture and inaugurated e brain-storming session. A directory on-line databases pertinent to electro- emistry, compiled by the Institute was o released at the hands of Shri K.V. ariwala, Chairman, Indian Chemical anufacturers Association, Western egion.

### elcome address

In his welcome address **Shri P.S. esikan,** Deputy Director, CECRI aced the beginnings of the Institute to er 42 years when the vision of men ch as Pandit Jawaharlal Nehru, . S.S. Bhatnagar and Dr. Alagappa hettiar saw fruition and the laboratory me into being in the then-remote araikudi. Since then he noted that e Institute had shown significant owth with many achievements to its edit. In electrochemicals the institute d made significant advances in devel- ping technologies for caustic soda and lorates.

Explaining the purpose behind these ain-storming sessions, Shri Desikan oted that they were primarily intended to allow electrochemists to interact ith scientists, academicians and perts who are not electrochemists but ave intimate knowledge of the state of t, evolving technologies, latest devel- pments and futuristic trends in specific reas of science. Such an interaction it hoped will enable us to identify areas here electrochemicals would begin to e adopted so that we in the Institute ould set up such projects''.

### Presidential address

Delivering his presidential address **Prof. S.K. Rangarajan,** Director, CECRI noted that an occasion such as a Foundation Day provided an opportunity to recall with gratitude the services rendered by all to make an institution what it is. ''To me, it gives an opportunity to ask several questions — in the state of flux that science and technology as well as society are in today, do we safeguard ourselves from distractions in goals and provide course corrections especially to avoid obsolescence and becoming irrelevant; are we sufficiently dynamic and coherent?

In the past such occasions signified to many a renewed commitment to innovation and excellence and to some others a concern for development of indigenous technology. Of late however an impression is gaining ground that it is enough if the commitment is to industrial growth and not necessarily to self reliance and independence. There is no basic conflict however. True industrial growth cannot be sustained without a large measure of indigenous technology.''

Outlining the goals for the future, Dr. Rangarajan noted that the thrust of research would be directed towards:

* Conservation and effective utilisation of energy and materials;
* Enhancement of environment quality;
* Building economy in design and development of futuristic technology.

Based on these tenets the Institute has identified a number of technologies which are likely to develop in the coming years. These include:

* Total technology for caustic soda by membrane cells
* Knowhow packages for perfluorinated compounds for use as intermediates in pharmaceutical and drug industries
* Future technologies for magnesium and aluminium
* Recovery of non-ferrous metals
* Electrochemical power sources like modern versions of maintenance free lead acid batteries, Ni-Fe batteries and fuel cells
* Corrosion control of concrete structures, buildings and bridges
* Surface coatings and protective schemes for conserving materials and structures
* New and economic corrosion resistant materials of construction
* Control of biofouling and corrosion of heat exchangers.

''In the next three years we hope to have made enough progress to provide turnkey options to the country'', Mr. Rangarajan added.

### Inaugural address

Inaugurating the brain-storming session on electrochemicals, Prof. M.M. Sharma, Director, UDCT, stressed the key note that electrochemistry plays in many processes. ''In any number of processes it is an essential process and not an optional one.... what is a very polluting process can be facilely converted into a environmentally benign process... free from the problems associated with scale-up'', said Prof. Sharma.

Complementing the role played by CECRI scientists in developing energy conservation techniques particularly for the caustic soda industries (through the use of dimensionally stable titanium anodes) Prof. Sharma noted that the plans of the Institute for the Eighth Plan were indeed well thought off.

Stressing the role played by such brain-storming sessions Prof. Sharma noted that generation of ideas is the key to success. ''Good science should be capable of being translated into good practice'' added Prof. Sharma.

The inauguration function concluded with the release of the directory on online databases by Shri K.V. Mariwala. Shri K.C. Narasimhan of CECRI proposed a vote of thanks.

CECRI FOUNDATION DAY LECTURE

# Science and Engineering of Electrochemical Processes

**M.M. SHARMA**

**Department of Chemical Technology, University of Bombay, Bombay 400 019.**

Electrochemical processes (ECP) are unique in the ambit of "Selectivity Engineering" in view of the high specificity, which is comparable in many cases to that realised in enzyme catalysed processes, mildness of operating conditions, avoidance of effluents, freedom from scale-up problems, etc. The use of "electrons" as a facile reagent has many fascinating features from a scientific view point and their impact on processes of practical relevance is substantial. In many cases of industrial importance ECP have no alternatives or very poor competing processes.

In India we are well suited to the pursuit of ECP, particularly for small to medium scale speciality chemicals, which are "knowledge engineering" based and where our knowhow can constitute an important component of the capital cost of the plant. ECP allow convenient dispersal of industries and transportation of hazardous chemicals can be obviated or drastically curtailed. ECP can also be environmentally benign.

ECP for organic synthesis have witnessed renewed interest, particularly after the success of electrohydrodimerisation of acrylonitrile (AN) to adiponitrile where quaternary ammonium compounds are used to increase the solubility of AN and also to provide an aprotic layer adjacent to the electrode to inhibit reduction of AN to propionitrile. Hydrotropes have been used to solubilise sparingly soluble solutes and even micelles have been deployed to realise specific reactions. The liquid-liquid electrolytic processes allow electrochemistry and organic chemistry to take place in their optimum medium.

New challenges lie in the synthesis of isocyanates, carbamates, etc., and the potential advantages of electrocatalysis have not been exploited. Paired synthesis, involving oxidation and reduction, merits more attention. Indirect electrochemical oxidations have special relevance to the speciality chemical industry. Oxidation of toluene to benzaldehyde and p-methoxytoluene to anisaldehyde with electrogenerated ceric salts are typical examples.

The well established electrolytic caustic soda/chlorine industry has witnessed spectacular developments with the advent of the dimensionally stable catalysed anode, use of permselective membranes with ultrapurification of brine, etc. The use of catalysed cathode holds promise and in-built fuel cell may have relevance in some parts of India. The use of dimensionally stable anodes has brought about a dramatic change in the technology of sodium hypochlorite and sodium chlorate. There are several on-site plants for hypochlorite, including those established at power plants for water treatment. In the case of the chlorate cells the anodic oxidation of hypochlorite is mass transfer limited but the slow homogenous liquid phase reaction demands long residence time.

The case of water electrolysis for making pure hydrogen on a small scale is most interesting as we now have cells operating under pressure, equivalent to that required for most hydrogenations, thus obviating the use of compressors, and solid electrolytes are round the corner with catalysed electrodes.

The production of $H_2O_2$, which started via an electrochemical process, has also seen fascinating developments as we can now consider an electrochemical $O_2$ reduction cell for on-site generation of $H_2O_2$ in alkaline media for pulp and paper plants, textiles etc. The chemical
engineering aspects of trickle bed
used in this process are interesting.
manufacture of aluminium via elect
sis of alumina dissolved in molten c
lite, is so far, the only viable proc
These high temperature ECP have
been studied to the desired ex
although reduction in the specific po
consumption has been realised thro
the use of lithium compounds in
electrolyte. The design of electroch
ical systems is complex and should
ognise the importance of hydrody
mics, mass transfer, macrokinetics, e
trocatalysis, effective conductivity
dispersions, etc.

The importance of mass trans
aspects, which play a crucial role,
been recognised and last five years ha
witnessed good activity. ECP are ty
ical heterogenous processes. Hydrod
anamics and mass transfer facto
therefore play an important role
scale-up and design of electrochemic
reactors. In view of this, considerab
efforts have been made to understan
the behaviour of gas evolving system
emulsion electrosynthesis, role of tu
bulence promoters, etc. A variety of ne
cell designs have been evolved keepin
in mind the specific requirements of a
application. In almost all these case
classical concepts in chemical engine
ering science have been useful. Fo
instance, rigorous implementation of th
concept of similarity in hydrodynamic
and mass transfer has led to reliabl
scale-up of ECP.

Electrochemistry has a wide range o
other industrial applications each o
which is being improved with the
understanding of the process as well as
input of new ideas. Electrowinning o
metal may witness replacement of Pb
(with some silver) anode by activated
Ti anode. Electroplating has been

ly investigated with a view to rstand the morphology of the sit. The use of ultrasonic irradiation ew idea) during electroplating has ded dense, hard and bright deposits ower voltages. The role of brighters is not properly understood. The tment of metal bearing effluents is deal application for electrochemis- The previously employed cementa- processes do not fit into the new ist on total elimination of a pollutant as much as a new solid waste is ated. On the other hand electroche- try is an ideal tool which converts ability (effluent) into an asset (recov- d, high purity metal). Even in the clear industry the reduction of $Pu^{4+}$ a liquid-liquid electrochemical stem has been considered. In view of special problems of this application vide range of cell designs have been olved e.g. fluidized bed cells, spouted d cells, pump cell, etc.

Efforts are being made to reduce elec- de polarisation. Oxidation of benzene hydroquinone, for example can be rried out at 75% lower voltage using air depolarised electrode in place of nventional electrode.

Solid electrolytes (with porous con- ucting membranes as electrodes) can e used to separate gases such as xygen, hydrogen, fluorine, etc. The reatment of off gases containing $SO_x$, $NO_x$, $Cl_2$ etc. in electrochemical cells has been considered. ECP can handle more complex chemistry and more sensitive products and are pregnant with many unsolved scientific problems. Electrochemical engineering deserves to be more vigorously supported. The challenges and rewards are plentiful.

## 'Environmental pressures will tilt the balance'

*Dr. S.K. Rangarajan, Director, CECRI, an internationally renowned scientist, has been at the helm of affairs at CECRI for the past two years. In an informal chat with CHEMICAL WEEKLY Dr. Rangarajan shares some of his views. Excerpts:*

### On the role of electrochemical sciences in industry

No established electrochemical industry is being displaced. As environmental pressures arise the break-even point between electrochemical and non-electrochemical processes is going to be in favour of electrochemical processes notwithstanding the cost of electric power. It is necessary to understand that all energy costs are going up and that electricity is only processed energy.

### Role of industry

Problem identification by industry is a lot more important than sponsorship for research. The role of progressive industrial people is vital. Just as scientists can be in a protective mould so also can industrialists. The role of such brain-storming sessions is to break such moulds.

### Scientific industrial research

It is something which we have only now evolved. While the CSIR's have been around for some time they have been stalled largely by academic scientists. They were all asked to do industrial research and the industries were not there — industries had to be nucleated. Over a period of time things have become better both from the point of view of industry and the scientific angle.

### Caustic soda industry and CECRI

The development of titanium substrate insoluble anodes (TSIA) was done over a considerable period of time. With industry's participation this could have been done a lot earlier. The project was successful because an industrial base was around to absorb technological output. In the absence of any industrial base such output tends to get ''quenched''.

AVAILABLE
EX-STOCK

PROPYLENE GLYCOL - I.P.

Please Contact:

**Ganesh Turnkey Projects & Lessors Ltd.**
C-20, Monarch, Shriniwas Bagarka Road, Andheri (E), Bombay - 400 059.
Phone: 298476
*Branches:* Delhi & Calcutta

# 'Identification of projects crucial'

The two day deliberations, which saw presentations by numerous scientists from industry as well as CECRI, highlighted the essential need to identify projects at the very beginning, carry out a rough evaluation of project costs, energy consumption, and other process economic factors. This kind of "paper research", as **Dr. A.V. Rama Rao**, Director, Indian Institute of Chemical Technology, Hyderabad put it, could help eliminate a number of processes at an early stage and focus attention on a few. It is this identification of niches, where electrochemical processes could work their charms, that would constitute a vital step in tuning to industry's exacting demands for viable, economically competitive, and technologically superior processes.

In his paper highlighting the achievements of CECRI, **Dr. K.C. Narasimhan** indicated the research work which have led to some commercially viable technologies. These included:

***Inorganic electrochemicals:***

1. Sodium chlorate (licensed)
2. Potassium chlorate (licensed)
3. Potassium and sodium bromates (licensed)
4. Potassium iodate (licensed)
5. Sodium, potassium & ammonium perchlorates (licensed)
6. Cuprous oxide (licensed)
7. Electrolytic manganese dioxide

***Electrodes:***

1. Titanium substrate insoluble anode
2. Graphite/titanium substrate lead dioxide anode

***Organic electrochemicals***

The following are the reactions and the products are given in brackets:

1. Reduction of aliphatic acids (Glyoxylic acid (from oxalic acid), succinic acid (from maleic anhydride)); 2. Reduction of aromatic acids (Benzyl alcohol, salicylaldehyde, dihydrophthalic acid); 3. Reduction of aliphatic and aromatic nitro compounds (UMDH, amino phenols, benzidines, p-amino benzoic acid, toluidenes); 4. Reduction of nitriles (Benzyl amine, beta phenyl ethyl amine; 5. Reductive dimerisations (Adiponitrile from acrylonitrile, pinacol from acetone); 6. Redox mediated oxidations: i) $Cr^{+3}/Cr^{+6}$ (Anthraquinone, saccharin, p-nitrobenzoic acid, camphor); ii) $Mn^{+2}/Mn^{+3}$ and $Ce^{+3}/Ce^{+4}$ (Benzaldehyde and substituted benzaldehydes); iii) $Br^{-}/OBr^{-}$ (a. Calcium gluconate (from glucose), calcium lactobinate (from lactose); b. Epoxides); 7. Redox mediated reduction $Ti^{3+}/Ti^{4+}$ (Reduction of nitro compounds to amine (e.g.) Aniline, metanilic acid; 8. Alkoxylation (2,5 dimethoxy furan from furan); 9. Halogenation (Bromoform, iodoform, chlorotoluenes, erythrosin and eosin).

He concluded his presentation by raising a number of points for consideration. These included:

1. Electrochemical route is considered pollution-free or with less pollution as compared to conventional chemical route. At the same time, the electricity cost is going higher and higher. How are we going to have compatibility?

2. Most of the important inorganic chemicals which are purely electrochemical in nature are being worked out on commercial scale. Now what are the new approaches and what are the new chemicals which can be prepared by electrochemical route to make them cost effective?

3. In electro-organic technology what are the emerging organic chemicals which have to be produced by electrolysis? (It is also possible that only a part of reaction or step may be achieved by electrochemical route, if not the entire steps.).

4. If the products or reactions are suffering from low yield, low selectivity or troublesome byproducts by conventional process, can they not be ma
successfully by electrochemic
method? What are the products belon
ing to this category?

5. Whether the reactions, especial
low demand high cost products, need
dedicated facility or a multi-purpose on
for making them cost effective?

6. Among drug and dye intermedi
ates, speciality chemicals, performanc
chemicals and materials, agrochemicals
perfumery chemicals etc., which are th
commercially important candidate
easily amenable for electrochemica
route with low cost, since most of the
reactions are based on oxidation o
reduction?

7. What is the future of conducting
polymers? Are there more candidates
like poly (p-phenylene vinylene (PPV)),

## DEVELOPMENT OF CATA
## TIC CATHODE

From early industrial age
steel has been used as cathode
hydrogen evolution reactions (H
in diaphragm cells and chlorate
for the production of caustic s
chlorine and chlorate respecti
Nickel plated mild steel is use
cathode in water electrolysis. B
the cathodes exhibit over-voltag
350-450 mV at 3 $kaM^{-2}$ cur
density. Corrosion products of m
steel deactivate the membrane
membrane chloralkali cells. W
steep rise in energy costs, an awa
ness of energy conservation, led
intensive research in electrocataly
for hydrogen evolution reacti
worldwide. In India, CECRI ha
undertaken several parall
approaches for the development
energy saving catalytic cathode
These cathodes show a reduction
cell voltage of the order of 0.2-0
volts as they have very low overvol
age of 70-80 mV at 3 kA $m^{-2}$ co
responding to a power saving
140-180 kwh per tonne of caustic

h can find better applications apart being used as electrodes in batter- Some copolymers made, for e.g. divinyl ether with maleic anhy- e or furan units containing alterna- y with succinic acid groupings, are ing very good applications in med- e. Can they or similar type also be pared by electrochemical route?

. In view of CFC becoming a ned item, will this affect the future lectrofluorinated compounds, which no doubt becoming more and more ortant in view of their multisided lications?

. Can the following be taken as chal- ges of future in the field of electro- ymerisation and phase transfer ctions?

Syntheses of polymers capable of hstanding extreme conditions of perature and pressure

Polymer blends/alloys

Polymers exhibiting good electrical nductivity and superconductivity etc.

Use of micelles and phase transfer alysts for enhancement of rates of erogenous reactions.

10. Similarly can the following be nsidered as challenges of the future using electrochemistry for converting mass.

To utilise polymeric raw materials as d stock

To degrade biomass by electrolysis sub units that are amenable to elec- chemical transformation to more val- ble products.

11. a. In chloralkali, apart from mem- ane cell and catalytic type of cathode oxygen reduction cathodes, what are other fields where still research has be taken up?

Whether conducting polymers can be ed as connectors in the $Cl_2$ atmos- ere to avoid corrosion?

12. What is the status and future of ero-gap cell or solid polymer electro- te electrolyser not only for chloralkali it also for hydrogen production by ater electrolysis (for SPE)?

AVAILABLE
FEED ADDITIVES
DL-METHIONINE
DINITOLMIDE BP
FURAZOLIDONE IP
L-LYSINE MONO HYDROCHLORIDE
Best Quality
Prepared from selected Raw-Materials, Perfectly Standardised,
Passed through rigid control tests of uniform superior quality
Available in attractive & Protective packings
at competitive rates
CONTACT :
V. Tribhovandas
Ranvir Mansion
66/70, Shamaldas Gandhi Marg, Bombay-400 002.
Gram : IODOFORM Phones : 317209/318716/318821
TELEX : 1182812-VT IN

AVAILABLE FROM READY STOCKS
MAGNESIUM OXIDE LIGHT HOLLAND
Rs. 35/- per kg.
MANGANESE CHLORIDE 98%
Rs. 16/- per kg.
MANGANESE SULPHATE 98%
Rs. 10/50 per kg
MANGANESE ACETATE 98%
Rs. 30/- per kg.
MAGNESIUM CHLORIDE CRYSTALS
Rs. 1/30 per kg.
STRONTIUM CHLORIDE 98%
Rs. 25/- per kg.
STRONTIUM CARBONATE LIGHT
Rs. 30/- per kg.
MAGNESIUM SULPHATE PURE SUGAR CRYSTALS
Rs. 3/- per kg
CONTACT: TRICO CHEMICALS
C/29, 19th Road, Chembur, Bombay 400 071.
Tel. No.: 5558265, 5557732, 4112934. Grams: TRICOGOLD
Delhi: R.K. GUPTAJI 8920745

Available from ready stock at concessional rate of Excise Duty

**LITHARGE**

**(Suitable for Chrome Pigments, PVC Stabilisers, Storage Battery Plates and Lead Based Chemical Industries)**

Contact Manufacturers:

**WESTERN OXIDES & CHEMICALS CO**

Room No. 33, 3rd Floor, Tardeo Air Conditioned Market, Tardeo Road, Bombay 400 034.
**Tel. Nos.: 4948377/4921587/4922673**

**EXPORT ENQUIRIES ALSO SOLICITED**

**WANTED URGENTLY**

**GREEN VAPOROID DYE EQUIVALENT TO ATUL GREEN VAPOROID DYE PXC FOR ACCELERATION OF THE EVAPORATION OF SEA BITTERNS. INITIALLY 200 Kgs. WOULD BE REQUIRED. TOTAL QUANTITY APPROXIMATELY 600 Kgs. PER ANNUM. PARTIES MAY QUOTE FOR THE ABOVE AND IF FOUND ACCEPTABLE SHOULD BE PREPARED TO SUPPLY 10 Kgs. ON TRIAL BASIS IMMEDIATELY. PLEASE REPLY IMMEDIATELY TO:**

**MANAGING DIRECTOR**
**Tamil Nadu Salt Corporation Ltd.**
LLA Buildings, No. 735, Anna Salai, Madras 600 002.
**Telephone No.: 862113** **Telex No.: 41-6113 LCOT IN**

TO MEET YOUR REQUIREMENTS OF

- **Monochloro Acetic Acid**
- **EDTA**

Contact Manufacturers

**SHREE KHODIYAR CHEMICALS**

Behind Juvansinghji Hospital, Bhavnagar 364 001.
**Phone: 29117, 29661, (R) 26708, 28523**
**Plant Plot No.: 202/203 Bhavnagar-Rajkot Road, Sihor.**

HOPAL GAS TRAGEDY

# Govt. argues for rejecting settlement, retaining amount

The Government of India on July 5th asked the Supreme Court to reject e 470 million US dollar settlement in e Bhopal gas case, but retain the mount until the issue of higher amages is decided. Making final sub-issions before a five judge constitution ench headed by the chief justice, Mr. istice Sabyasachi Mukharji hearing etitions seeking a review of the settle-ent, the attorney general, Mr. Soli So-bjee said the court should have no in-ibitions in striking down the settlement s it had only primarily approved it.

Mr. Sorabjee accused the Union Car-ide Corporation of hurrying through ayments of the 470 million US dollars o serve its own interests and to evade riminal prosecution. Some judges ncluding the Chief Justice immediately xpressed their concern whether such retention would be 'gentlemanly' as the money had come into the country on an understanding.

The Chief Justice said however "despicable" the Union Carbide's conduct has been in bringing about the tragedy, the issue before the court now was, would it be proper to go back on an understanding for which the apex court had put the seal of approval. Mr. Sorabjee made it clear that at this point the Union of India was not claiming here and now, the right to appropriate the said monies in execution. Its plea is for the retention of the monies till the issue regarding damages payable by UCC is decided.

Mr. Sorabjee said the court was under no moral obligation to validate the settlement as it had only accorded formal approval to the compromise. Apart from moral considerations, Mr. Justice K.N. Singh wanted to know whether it was legally possible to retain the money, in case the settlement was struck down. Mr. Sorabjee replied that the amount could be retained subject to the court's direction.

The attorney general said the memorandum of the $470 million settlement was prepared by the parties (UCC and the government) and its terms, its terminology, its format and its methodology were a matter of agreement between parties. It was only to effectuate the terms of settlement that the court passed the orders of February 14 and 15 1989. Mr. Sorabjee submitted that it was not open to any of the parties to the settlement, to place the responsibility for incorporating clauses regarding quashing of criminal proceedings and grant of criminal immunity on the court.

"Parties acted on their own with open eyes and the legal consequences of the aforesaid clauses can be legitimately imputed to them" he said.

ROHAN DYES AND INTERMEDIATES
(AHMEDABAD)
FOR YOUR REQUIREMENTS AS PER INTERNATIONAL STANDARD TOP IN QUALITY

- GAMMA ACID
- G. SALT
- R. SALT
- META UREIDO ANILINE HCL
- K. ACID
- AMIDO G. SALT
- S.P.C.P.
- S.P.M.P.
- 2.5 DICHLORO S.P.M. P.
- P.M. P.
- SULFANILIC ACID (TECH. GRADE)
- SULFANILIC ACID (PURIFIED)
- SCHAFFER'S ACID
- 4-NAP
- 4-NAPSA

AND SHORTLY INTRODUCING MANY NEW ITEMS & A RANGE OF DIRECT, ACID AND REACTIVE DYES

ROHAN DYES & INTERMEDIATES

OFFICE :
189, NEW CLOTH MARKET,
AHMEDABAD-380002.
PH. : 368171 & 360758, FAX : 272-346412
TELEX : 1216942 JITM IN

BOMBAY OFFICE :
2ND FLOOR, PUSHPAWATI BLDG. NO. 2,
CHANDANWADI, GIRGAON ROAD,
BOMBAY-400002.
TEL. 256740 , 298224 TLX : 01182383

FACTORY :
115, GIDC, PHASE I, VATVA,
AHMEDABAD-380045.
PH. : 831131-2, 833771 & 834469

DISTRIBUTOR :
RONAK ENTERPRISES
B/2, RAJDEEP PARK FLATS,
BALIAKAKA RD., AHMEDABAD
TEL 396719 & 395475

# Scientists ignorant of environmental hazards

The specific negative environmental impacts of various modes of power generation are unclear even to those who might be expected to know most about them, namely the country's scientists and technologists, a recent Atomic Energy Regulation Board survey of predominantly science professionals has shown.

More than 150 respondents, a fifth of the total number surveyed, felt that the environment is not endangered by the power stations, according to the Board chairman, Prof. A.K. De, who did the survey with his two colleagues, Prof. K.S. Parthasarathy and Prof. A.S. Kulkarni.

Though 70 per cent were aware that coal power stations posed the greatest threat to the environment, only about half were able to accurately link the greenhouse effect with them, the report, published in this month's AERB bulletin, says.

Surprisingly, 10.7 per cent of the scientists associated the phenomenon of acid rain with nuclear power, 11.6 per cent and 1.3 per cent respectively thought that the greenhouse effect and flyash were associated with it. Totally 762 people responded to the questionnaire. These were drawn from the students, faculty and administrative staff of the Indian Institutes of Technology at Bangalore and Kanpur, the Tata Institute of Social Sciences in Bombay, the University of Roorkee, the Indian Institute of Science at Bangalore, and the Saha Institute of Nuclear Physics, in 5:3:2 ratio.

There were eight times more men than women surveyed, 21.3 per cent had doctoral qualifications. Incidentally, only 24 of the 100 randomly selected AERB newsletter readers who were sent questionnaires bothered to reply, a reflection perhaps, of the importance they attached to surveys of this sort.

The association between radioactive waste and nuclear power was known to most of the respondents, the survey reported, but few were concerned about the submersion of forest land due to hydel stations.

''In other categories'', the survey says, the ''knowledge was even poorer''. The survey respondents seemed to fear genetic defects more than cancer, with 85 per cent stating that genetic defects were the main observed effect of the Hiroshima and Nagasaki bombings, while only 15 to 30 per cent considered that cancer had bee main effect observed. Additional fear of serious atomic accidents se to prompt the response of 35 pe who felt that the environmental i of nuclear power was ''severe''.

On the positive side, 83 per cer that coal alone could not meet the try's power needs during the nex decades, and 69 per cent knew annual per capita electricity cons tion in the country is about 200 An overwhelming 72 per cent felt the conservation of energy improvement of efficiency alone c improve the energy situation by up per cent.

An additional 47 per cent thought non-conventional power sources c take care of the whole country's po needs, provided sufficient funds v made available for research in this nascent area. A minority of 16 per was of the view that all the count needs could be met by hydro power tions, including microhydel station

## A.C. WADHAWAN

The Government has approved appointment of Mr. A.C. Wadhawar the Chairman and Managing Director Hindustan Zinc Ltd., consequent to upgradation of the company to a sch dule 'A' Central public sector compa

For Your Requirements Of:

**ACETONE** (In Drums & Tanker Load)
**ETHYL ACETATE** (In Drums & Tanker Load)
**TOLUENE** (In Drums & Tanker Load)

ANILINE OIL
BENZENE
BUTANOL
BUTYL ACETATE
CYCLOHEXANONE
FORMALDEHYDE

ISOPROPYL ALCOHOL
D.M.T.
M.E.K.
M.I.B.K.
PHENOL
XYLENE

Please Contact:

**KOMAL TRADING CO.**
501/9, New Anant Bhuvan, 5th Floor, Narsi Natha Street, Bombay 400 009.
Telephone: Office: 8552305 Resi.: 5602299

# s. 2000-cr. Bombay High project awaits PIB nod

The Ministry of Petroleum has eared the Oil and Natural Gas Com- ssion's proposals for the Bombay gh, Neelam, and Mukta fields, and bmitted them to the Public Invest- ents Board. The Bombay High project estimated to cost Rs. 2002 crores.

Gas that is being flared now for want proper outlet would be collected from ombay High and its satellite fields, en compressed, and sent to Hazira to put into the HBJ pipeline.

Construction work, which would take 1/2 years would include a new off- ore platform with compression facil- es, a pipeline to South Bassein atform and a fresh submarine platform Hazira, where additional receiving nd terminal facilities would also be set p.

This burning of gas is the direct and nevitable consequence of damage done Bombay High by the failure to re- ressurise it sufficiently during the years 982 to 1989.

All three projects will be considered t the PIB meeting on August 9, to be haired by Mr. Mishra, Secretary Expenditure) in the Ministry of Finance.

It will be attended by Dr. Madhav Godbole, Secretary, Petroleum, the Advisor (PAB) in the Planning Commission, and representatives of the other Ministries.

Yet the Petroleum Ministry's original effort to couple the Bombay High gas project with the shutdown of high gas-oil ratio wells — in order to save gas and repressurise the reservoir — has virtually been ruled out by the Ministry of Finance.

The Petroleum Ministry officials say that this proposal will be considered separately, probably by the Cabinet.

High officials in the Finance Ministry say that the temporary closing of these wells would entail an additional import of 11.6 million tonnes of crude over three years, costing over $1.5 billion. The impact on the balance of payments would, they maintain, be intolerable.

It is expected that the burning of associated gas in Bombay High would cease entirely. Associated gas is dissolved in petroleum crude, as distinct from free gas, found in geographically distinct fields. It is flared at the well or the production platform only in the absence of facilities to transport it.

Today, 14.5 million cubic metres of associated gas is burnt every day from Bombay High and its satellite fields, of the 30 million metres produced. This is because the gas-oil ratios have risen sharply. Ratios above 300 are considered unhealthy. Many Bombay High wells have ratios which exceed 1000.

These very high ratios signify not only that so much must be burnt off, but also that the reservior is damaged. Consequently, the cost of extraction of petroleum crude goes up considerably.

## NEW DEVICE TO CUT PETROL CONSUMPTION

A Calcutta-based technologist has claimed a breakthrough in reducing the use of petrol by mixing a high-tech chemical composition. The technologist, Mr. Swapan Kumar Sen, after years of lab-to-automobile experiments, has developed and perfected the liquid chemical composition which helps reduce the consumption of fuel on an average of 25 per cent.

Mr. Sen who worked several years as chief chemist in the R and D department of a number of industries is now engaged in his own small laboratory in south Calcutta to convert "waste-to-wealth". Referring to the new find, Mr. Sen claimed that it would not only reduce consumption of petrol but also effectively check emission of carbon monoxide and toxic lead derivatives by controlling automobile pollution to a large extent.

He said that a measured dose of the composition, mixed with one litre of petrol, would improve engine performance and yield "quite satisfactory" milage. Extensive field trials on the automobile and other industrial units consuming petroleum products were found to be satisfactory with reduction of fuel consumption varying between 20 per cent on the lower side and 39.6 per cent on the higher side.

He said the country imports $8,000 million worth of crude oil. "If this composition is used, I am sure at least 25 per cent import burden on an average can be saved", he said. Mr. Sen said the "fuel saver" could also be used with kerosene for domestic and other commercial purposes to effectively tackle the kerosene scarcity.

## RAJ PRAKASH CHEMICALS

Raj Prakash Chemicals has suffered a setback during the year ended March 1990. The gross profit has declined to Rs. 80.24 lakhs from Rs. 89.60 lakhs for the past nine month period. The turnover is Rs. 550.93 lakhs against Rs. 500.43 lakhs. It has announced a dividend of 12% against 10% (annualised 13.33%) the net profit has slumped to Rs. 16.53 lakhs from Rs. 43.94 lakhs after depreciation (Rs. 32.65 lakhs against Rs. 17.31 lakhs), taxation (Rs. 3.85 lakhs against Rs. 5 lakhs) investment allowance reserve (nil against Rs. 12.25 lakhs) and writing off miscellaneous expenditure (Rs. 27.21 lakhs against Rs. 10.90 lakhs), the pro posed dividend will absorb Rs. 12.60 lakhs against Rs. 5.60 lakhs.

# Plea to review LPG policy

The Ministry of Petroleum and Natural Gas has been urged to review its LPG policy and the instruction issued recently regarding the release of LPG for bulk customers.

The Ministry had recently issued instructions for the release of bulk liquefied petroleum gas for bulk customers on last year's monthly offtake irrespective of the approved quantity this year.

This has greatly disturbed the industry and has given rise to apprehensions that the inadequate availability of LPG might hamper production.

In a correspondence to the Minister for Petroleum, the PHD Chamber of Commerce and Industry President, Mr. R.K. Somani, urged for an immediate withdrawal of the said instructions on LPG, issued to companies like Indian Oil Corporation, Bharat Petroleum and the Hindustan Petroleum Coporation.

The Chamber President said that an arbitrary cut in the allocation of LPG to producer units would throw them out of gear and would force many of them to curtail their production.

This would have multiplier effects and would lead to social tensions, stunted growth in the economy and even a down turn in the export growth rate, he said.

Underlining the need for oil conservation measures in the country, specially in the context of the unfavourble balance of payments position the country in facing at present, Mr. Somani felt that the possibilities of overhauling the distribution system of LPG should be considered.

Significantly, the Government had issued instructions for limiting the supply of LPG for bulk customers on the basis of monthly offtakes during last year, instead of the actual rec
ments already approved by the oi
porations.

PHDCCI will conduct energy a
in the manufacturing sector.

---

## PETROCHEM UNITS TOLD T
## BOOST EXPORTS

The Petroleum and Chemicals M
ter, Mr. M.S. Gurupadaswamy, a
the industry to go all out to give a th
to exports in the petrochemical se

Inaugurating a seminar on frontie
polymer technology and applica
organized by the Delhi Branch of
Jadavpur University Alumni Asso
tion at Delhi, on July 28th the Mini
said the Government had alre
planned a long-term integrated grow
oriented development of the petroch
ical industry.

Some olefinic and aromatic co
plexes would be set up during
Eighth Plan and the Indian Petroche
icals Corporation Ltd., (IPCL) w
planning to go into the high technolo
area of engineering plastics, the Min
ter said.

Mr. Gurupadaswamy emphasised t
need for further development of t
plastic industry, already employing ov
4.5 million people to open up emplo
ment opportunities.

In his keynote address at the sem
nar, Mr. H.C. Gandhi, Secretary, Tec
nical Development of India, said th
growth rate of the polymer and plast
processing industry in the country wa
about 15 per cent.

In the past, most polymers were lim
ited to products like film and fibre
Recently they were being used increas
ingly in structural applications and as
metal replacement capable of bein
used at high temperatures and havin
properties of good electrical conduc
tors.

AVAILABLE

Ready Stock

**Methylene Chloride**

99% Purity

in 250 Kg. Net wt. (Drum)

Contact for your regular requirements

**GLOBLE AGENCIES**

Pooran Asha Building,
31/, Narsi Natha Street, Bombay-400 009.
Phone: 335061 (10 LINES) Gram: INCHEMOX
Telex: 11-76723 CHMX IN Fax: 91-22-855 89 38

CONTACT FOR MOST COMPETITIVE CIF PRICES FOR

**Aniline Oil**
**Beta Naphthol**
**Benzaldehyde**
**Hydroquinone**
**M.I.B.K.**
**M.E.K.**
**Melamine**
**N-Propanol**
**Phenol**
**Phthalic Anhydride**

**M/s. OCEAN TRADING CORPORATION**

329, A to Z Industrial Estate, G. Kadam Marg, (Ferguson Road),
Lower Parel, Bombay 13.

**Phone: 4921664/4921669/4921711 Telex: 011 71564 DAYA IN**

---

VINOSHA

FOR YOUR REQUIREMENT OF EFFICIENT HEATING AND DRYING EQUIPMENTS LIKE:-

☐ FULLY AUTOMATIC OIL FIRED NON-IBR BOILERS UPTO 500 KGS/HOUR.
☐ OIL FIRED THERMIC FLUID HEATING SYSTEMS IN ALL CAPACITIES.
☐ COAL/WOOD/HUSK FIRED THERMIC FLUID HEATING SYSTEMS.
☐ OIL FIRED TRAY DRIERS FOR 200 TO 1200 TRAYS.
☐ INDUSTRIAL DRYING OVENS IN ALL CAPACITIES HEATED BY ELECTRICITY/STEAM/THERMIC FLUID.
☐ FLUID BED DRIERS.
☐ HOT WATER GENERATORS.
☐ WASTE HEAT RECOVERY SYSTEMS.
☐ ROTOCONE VACCUM DRIER.

**M/s. VINOSHA BOILERS PVT. LTD.**

204 CHANDAN CHAMBERS, 138, MODI STREET, FORT MARKET, BOMBAY - 400 001.
TELEPHONE: 2611515/2612061 GRAMS: 'VINOSHA' TELEX: 011-76004-SAIR IN

### GOVT. FIRM ON FOREIGN PARTICIPATION

# Fourth round bidding for oil exploration soon

The government is determined to invite foreign participation in oil exploration in selected blocks, in spite of opposition from domestic oil companies.

The fourth round of bids for inviting foreign companies is to begin soon and tenders are to be issued in a couple of months, the petroleum and chemicals minister, Mr. M.S. Gurupadaswamy said.

This sets at rest all speculations of foreign participation as the domestic oil companies had been questioning the need for foreign participation because of the latter's poor track record. For the fourth round of bids, the previous Congress (I) government had set up a committee headed by Mr. Lavraj Kumar, former petroleum secretary, which identified 62 blocks and 33 offshore ones for inviting bids.

Bids are expected to be issued sometime in the last week of September or first week of October when the state-owned Oil and Natural Gas Commission plays host to an international seminar on oil exploration to commemorate 100 years of oil exploration in India for which many foreign oil companies have been invited to present papers, informed sources said.

The country has so far witnessed three rounds of bidding for exploration. The first round being in 1979 when 32 blocks were offered, 15 onshore and 17 offshore. In the second round in 1982, 50 blocks were offered — eight onshore and 42 offshore. However, no contract was signed with any company.

In the third round in 1986, 27 blocks were offered, all offshore out of which contracts were signed with five companies for a total of nine blocks covering an area of 119,960 square kms. Mr. Gurupadaswamy said he was for more intensified oil exploration and expansion of the refinery capacities in the country so that the nation could meet the growing demand for petroleum products.

Asked about the opposition by some oil companies to foreign participation on grounds they had not achieved success compared to domestic companies, Mr. Gurupadaswamy said the foreign companies had been given more difficult blocks to operate in.

"After all it is a production sharing agreement with foreign oil comp he said adding, "we don't lose an If they don't strike oil they st lose".

Mr. Gurupadaswamy sai government wanted to augment t 18 million tonnes — creatin capacity of 12 million tonne expanding existing refining capa another six million tonnes.

Asked about the inordinate de pushing ahead with the Karnal re in Haryana, Managalore refine Karnataka and the Gulaghai refine Assam, Mr. Gurupadaswamy sai government will decide on the expedition of the three refin quickly.

The Karnal refinery, for which then Prime Minister, Mr. Rajiv Ga had laid the foundation stone as e as 1986, has been hanging fire and collaborating Soviet Union has as India to expedite the project.

There was some delay in the pro because of a hitch in getting a f committment from a private se company for joint sector participat

Karnal is a six million tonne annum capacity refinery which expected to meet entirely the needs northwest India for petroleum produ

Available Regularly Indigenous

**DRUG INTERMEDIATES**
**4-Hydroxyphenyl Acetamide**
**p-Anisaldehyde**
**p-Hydroxy Benzaldehyde**
**3,4,5 Trimethoxy Benzaldehyde**
**Aceto Acetanilide (White)**
**o-Chloro Benzaldehyde**

**AROMATICS**
**Cinnamic Acid**
**Cinnamaldehyde**
**Amyl Cinnamaldehyde**
**Heptaldehyde**
**Yara-Yara**
**Isatoic Anhydride**
**Phenyl Methyl Anthranilate**

Only Actual Consumers May Contact Manufacturer
**Srivastava Organic Industries**
B-20, Om Ganesh Appt., Pt. Dindayal Road, Dombivli (W), Distt. Thana, Maharashtra

ICMA

INDIAN CHEMICAL MANUFACTURERS ASSOCIATION

**Indian Chemical Manufacturers Association**

**CHIEF - TECHNICAL SECRETARIAT — BOMBAY**

**The Association** Founded in 1938; ICMA is a voluntary, non-profit apex body representing the entire chemical industry like Organic and Inorganic Chemicals, Petrochemicals, Dyes, etc. This now accounts for 30% of the Gross National Industrial Output. ICMA renders professional services, acts as a link with Central & State Governments, international organisations and promotes the interests of the industry and society. Its national headquarters are at Delhi and regional offices are located at the four metro cities.

**The Position** As Head of the Technical Secretariat at Bombay reporting to the Secretary-General, the incumbent will co-ordinate activities that the secretariat renders to the industry on behalf of ICMA in areas like health, safety, environment and other technical fields. This involves highlighting recent advancements, disseminating information and mobilising effective technical reference sources to facilitate members.

**The Person** An individual possessing track record of scientific/technical contribution in related R&D areas with a Post Graduate Degree in Chemistry or Chemical Engineering would be at an advantage. Preferred age 35 - 45 years.

Compensation will be commensurate with the person's background and potential.

Interested persons may send detailed bio-data to Mr. V.K. Punshi, Executive Director, Hindustan Lever,
165/166 Backbay Reclamation,
Bombay 400020.

FOR YOUR REQUIREMENTS OF IMPORTED
PHARMACEUTICALS, DRUGS & CHEMICALS
at Competitive Prices

KOLLIDONE/PLASDONE U.S.P.
(Polivinyl Pyrrolidone BASF
Pharmaceutical Grade)
HYDROXY PROPYL METHYL CELLULOSE
(Methocel E-5, E-15, E-50)
(Pharmacoat 603, 606, 615)
ETHYL CELLULOSE Dow/Hercules
CALCIUM D PANTOTHENATE USP
GENTAMYCIN SULPHATE BP 80/USP
S.L.S. NEEDLES
CHOLESTRAL
MENTHOL
ISOPROPYL MYRISTATE

HYDROXY ETHYL CELLULOSE
(Natrosol 250 LR/GR)
METHYL CELLULOSE (400, 4000 CPS)
TERTIARY BUTYL HYDROQUINONE (T.B.H
VANILIN/ETHYL VANILLIN USP

PROPYLENE GLYCOL USP DOW/ARCO
BETAIN HCL
D-PANTOTHENYL ALCOHOL USP
NEOMYCIN SULPHATE USP
SACHHARIN SODIUM
HEXYL RESORCINOL
AEROSIL 200

FORMIC ACID

ALSO COMPETITIVE INDENTS FOR

ANETHOLE 20/21, 21/23
L CARVONE
PEPPERMINT OIL
SACHHARIN SODIUM
CINNAMIC ALDEHYDE

EUGENOL
CLOVE OIL
SPEARMINT OIL
SODIUM MONOFLUORO PHOSPHATE
GUMS

Please Contact:

**HARISONS CHEMICALS**

51, Popatwadi, 1st Floor, Kalbadevi Road, Bombay 400 002.
Telephone No. 298691, 296439, 254291 Telex No.: 011-3968 HARI IN Telegram: CONQU

WE TAKE EXTRA CARE • INDIAN GUM INDUSTRIES LTD •

*QUALITY * RELIABILITY * EXCELLENCE*

*Available Ex-Stock*

PROPYLENE GLYCOL USP (DOW)
Adipic Acid
Methylene Chloride
Hydroxyl Amine Sulphate
2-Chloro Propionic Acid

**REQUIRED FOR EXPORT**

Norfloxacin USP
Ibuprofen
Niacin BP
Schaeffers Acid
Pyrantal Pamoate USP
6-Nitro-1-Diazo-2-Naphthol-4-Sulphonic Acid
(2:5 Dichloro-4-Sulfophenyl)-3-Methyl-5-Pyrazolone)

**Indian Gum Industries Limited**
(Recognised Export House)
51-A, Maker Chamber IV, Nariman Point, Bombay 400 021
Telex: 2139 IGUM. Tel: 243711-12-30-60

# ONGC may hire OSVs at global market rates

The Oil and Natural Gas Commission thinking of hiring offshore supply ssels (OSVs) at international market es for all its future requirements. owever, all existing Indian OSVs may ntinue to get the prevailing price pref-ence and are likely to be offered rates sed on the old formula. New vessels quired by Indian companies are likely be hired only at international market tes.

It is learnt that the Government has sked ONGC to hire OSVs at market tes rather than giving preferential rate Indian companies, for its additional equirements. This means Indian companies going for new OSVs will have to ompete with international OSV operators. Incidentally, ONGC is yet to hire wo OSVs acquired by Varun Shipping Company in June because of which the company is losing heavily.

Similarly, Great Eastern has already concluded a deal for acquiring five OSVs of which two will be joining its fleet this month and the rest by September. Both Great Eastern and Varun may have to compete in the international bidding to get jobs for their new vessels. Earlier ONGC was thinking of hiring up to 20 per cent of its requirements on market rate but now the Finance Ministry is understood to have asked the Commission to hire on international rates 100 per cent of its requirements. As the international rates for OSVs are firming up, the Indian owners may not be affected by the ONGC move in the near future.

Even for the existing Indian OSVs ONGC was not prepared to offer the old rates based on the earlier formula. However, following various representations, the Petroleum Ministry is understood to have advised ONGC to continue the old formula. Since the expiry of the five-year contract in 1988, ONGC has been paying ad hoc rates to Indian owners, which, according to them, were too uneconomical.

OSV owners allege that ONGC owes them arrears amounting over Rs. 27 crores till June end. Meanwhile, with a view to redressing their grievances, ONGC has invited OSV owners individually during the first week of August. A meeting scheduled between the ONGC Chairman and shipowners early in July to discuss on charter rates could not take place and a fresh date is yet to be fixed.

Indian shipowners feel that the ONGC move will go counter to the avowed objective of indigenisation of the offshore services. They have already made huge investments to create OSV tonnage and other offshore equipment. This has resulted in saving of crores of rupees in foreign exchange.

## MINISTRY TURNS DOWN IPL PROPOSAL

The Petroleum and Chemicals Ministry has turned down the proposal of International Petroleum Limited (IPL) for assigning its rights in an oil exploration contract in India to a wholly owned subsidiary set up by it.

The International Petroleum Limited, Bermuda, had won a contract for offshore oil exploration in India in the third round of bidding organised by the government. Subsequently, it set up another company International Petroleum India Limited (IPIL) in Bermuda for carrying out its operations in India. IPL also sought government's permission in assigning 100 per cent of its rights to International Petroleum India Ltd. The petroleum department has rejected the proposal. IPL is understood to have sought a review of the ministry's decision.

WD-40
FOR INSTANT
MAINTENANCE

Lubricates,
Stops Squeaks,
Protects Metal,
Loosens rusted parts,
Displaces moisture,
Starts Wet engines.

Under license from
WD-40 Co., U.S.A.

Manufactured and Marketed by:
**Accra Pac (India) Pvt. Ltd.**
917, Raheja Chambers,
Nariman Point, Bombay-400 021.
Tel: 244074, 234409.
Tlx: 011-85771 APIB IN.FAX: 22-2043881.

**Distributorship enquiries Solicited from the following segments:**
Industrial, Electrical, Hardware, Equipment Dealers, Automotive, Farm Co-Operatives & Govt. Supplies.

Alfred Allan

OIL & GAS SECTOR

# Middlemen to be kept out of deals

The government has decided to eliminate middlemen from deals in the oil and natural gas sector. Necessary guidelines, clearly laying down that the government will deal directly with manufacturers and suppliers and not through any middlemen, agents, etc. whether Indian or foreign, are now being framed.

It has also been decided to encourage vendors who would be mostly manufacturers or their sole selling agents or reputed stockists to deal directly with purchasing organisations. The Department of Petroleum and Natural Gas has already carried out a review of the policy regarding Indian agents for procurement of supplies and services from abroad and the guidelines will be recommended to the chief executives off the public sector undertakings by the Ministry for implementation shortly.

This information was given by the Petroleum and Chemicals Minister, Mr. M.S. Gurupadaswamy, at a meeting of the chief executives of the public sector undertakings under his ministry at New Delhi on July 26.

Mr. Gurupadaswamy also emphasised the importance of close monitoring of the implementation of projects and completing them on time. The chief executives should fix the responsibility for time and cost overruns and take immediate remedial and preventive action as may be necessary. He said that cheif executives should personally review the financial and physical performance against the targets on a regular basis. Maximum emphasis will be laid on these parameters for assessing the performance of the chief executives, the minister said.

The minister also emphasised the importance of environmental conservation and safety and said that these aspects should be accorded the highest priority by all public sector undertakings.

Referring to the recent steps taken to create mass awareness about the importance of conserving the petroleum products, Mr. Gurupadaswamy asked chief executives to create the necessary climate by launching an effective campaign for bringing home the need for petroleum conservation. In this context, the minister referred to the balance of payments problem being faced by the country and the need to curb the consumption of petroleum products by user industries, particularly in the petroleum and chemicals sector by improving efficiency. He also directed chief execu to identify areas of economy in exp diture in their undertakings.

## PANEL ON PETROL STRATE SET UP

Members of Parliament attached the Ministry of Petroleum and Ch icals have questioned the effectiven of the petrol conservation measu announced by the government. T minister, Mr. M.S. Gurupadaswar claimed the steps would yield tangi results in three months. He said the go emment would take stern measures save petrol if the present experime failed.

Addressing a meeting of the consu tative committee, the minster disclos that oil companies had been asked submit assessment reports within thr months, following which the govern ment would decide on further steps. A inter-ministerial working group ha been set up to finalise a strategy fo energy conservation. "We expect tha the recommendations made by thi group would form the basis for launching a well-co-ordinated conservatio effort in the medium-term", he said When members questioned the measures taken by the government, the minister invited them to offer alternative solutions. He said he had an open mind and was prepared for change.

Potato Starch

Pioneer Manufacturers in India :

NARAYAN & CO.

C/o Narayan Stores, Manglam Building, Kankuwadi, Phirozshah Mehta Road,
Vile-Parle (E), Bombay-400 057. PHONES : 614 59 52 • 614 82 26

# MMTC will import pig iron, tin

The Minerals and Metals Trading rporation (MMTC) will now be porting pig iron and tin which were canalised earlier this year. This decion has been taken because the small ctor felt that, decanalisation of founy grade pig iron and tin had not been much help to them as small quanties required by them could not be nported economically in the internaonal market, according to informed urces at New Delhi.

MMTC which has already been sued the licence would arrange for nports by bulking the demand of varous users. The sources said in order to ut down foreign exchange, MMTC vould import pig iron from rupee paynent areas (RPA) especially the Soviet Jnion.

The prices of pig iron in India are igher than the international prices ecause of heavy duty imposed on the commodity, according to the sources. Some times pig iron would cost more han the price fixed by Steel Authority of India Ltd. (SAIL) because of high mport duty, they pointed out.

MMTC had already met several importers and confirmed many orders. MMTC was hopeful of getting large orders for tin. Many erstwhile buyers had also confirmed their desire to import tin through MMTC, the sources said.

As for pig iron, MMTC had already received orders for import of 20,000 tonnes which was likely to go up. For tin the corporation would float a global tender. MMTC has till now been importing from Malaysia or Brazil. The important tin suppliers in the world are Malaysia, Indonesia, Thailand and Brazil. Columbia is also said to have some reserves.

Meanwhile, the central liaision committee on iron and steel items of MMTC which met at New Delhi had requested the Government to announce advance foreign exchange clearance facility for next year by December this year to maintain continuity in the supply of steel items to the industry. Usually to maintain continuity in the supply, foreign exchange is committed in advance to place orders before the commencement of the next fiscal year. However, shipment are made the following fiscal year.

Recognising the need for rationalisation of import duty structure of iron and steel items, the committee decided to approach the Government for suitable duty adjustment. Present high landed costs as compared to prevailing domestic prices, were impending the imports of essential iron and steel items which were in short supply in the country and were vital for development.

---

## SAIL MOOTS PROPOSAL: SINGHBUM MAY EXPORT IRON ORE

Bihar's Singhbum district which is rich in some strategic minerals, may soon become a major export centre in the country. It has become possible because of the recently created raw materials division of the Steel Authority of India Ltd. (SAIL) which recently mooted a proposal to export iron ore fines from the region.

The executive director of the division, Mr. P.R. Merh, also held preliminary discussion with the Minerals and Metal Trading Coporation of India Ltd. (MMTC), the central agency for export of goods from the country. The initial reaction of the agency is reported to be quite favourable. It is hoped that the proposal will be put through in the near future.

Official sources revealed that there is stock totalling 35 million tonnes of iron ore fines which can be exported to Japan and other countries. The sources said that even China could welcome this raw material which is used in the steel industry. We presently export iron ore lumps of the order of 25 million tonnes. There is also a proposal to set up a 3.36 million tonnes beneficiation plant at Gua in Singhbum district to improve the quality of the raw materials, and hence command a better price.

For the success of these schemes it is essential that the iron ore mines get an adequate quantity of power and production is not hindered. Presently, they are dependant for power supply on the Bihar State Electricity Board. This arrangement however is not working to the full satisfaction of officals in the raw materials division. It is proposed to set up a captive power plant for the iron ore mines. The power requirement of the mines has been assessed at ten mega watt.

Until this plant becomes operational, the state electricity board is requested to pay better attention to these mines. Some officials of the division who were at New Delhi recently met the chairman and other top officials of the board in this connection.

---

## ISRO TO USE ERS SATELLITE TO TAP GROUNDWATER SOURCES

The Indian Space Research Organisation (ISRO) has finalised an agreement with European Space Agency to receive micro-wave data from European Remote Sensing (ERS) satellite for locating ground water sources. Announcing this at Ahmedabad on July 27, Prof. U.R. Rao, Chairman, said India would receive data at the National Remote Sensing Agency at Hyderabad from synthetic aperture radar and other micro-wave sensor. This will provide better penetration in locating groundwater sources and measuring the amount of groundwater than the optical sensor method being used at present. Pro. Rao said the data receiving centre at Hyderabad would begin soon, while the ERS satellite was expected to be launched sometime next year.

### CHECKING UNDERINVOICING OF IMPORTS

# India seeks change in Gatt valuation code

In a bid to discourage underinvoicing of imports and plug revenue leakages, India has pressed for a significant change in the import valuation code under the General Agreement on Tariffs and Trade (Gatt).

The code at present stipulates that the government of an importing country has to treat the invoice issued by the exporter as the only authoritative and unchallengeable basis for computing the value of the imported item. The import duty, therefore, has to be levied on the basis of the invoice value and no other valuation by other agencies should be acceptable under Gatt.

India has held that it should be allowed to retain the right to determine the value of imported goods on the basis of information and investigations other than the invoice. In other words, it has questioned the Gatt code that makes invoices sacrosanct in so far as the value of imported goods has to be assessed for levying customs duty.

The Indian case for disregarding invoice as the only basis for computing value of imports is justified on the ground that there is large-scale underinvoicing of imports into India, resorted to with the objective of reducing the incidence of customs duty.

Thus, in many cases, exporters to India agree to quoting a lower price on the invoice. Arrangements for paying the difference between the invoice price and the actual price is made by the Indian importer either through a third party stationed abroad or through other methods. As a result, the government loses customs revenue to the extent of the underinvoicing.

In an attempt to plug this loophole, the revenue intelligence agencies in the country have been trying to detect cases of underinvoiced imports. But such activities cannot be stepped up because of the Gatt valuation code. Interestingly, the code permits the government of the importing country to determine the value of the imported items on bases other than the invoice only when the invoice is not available. But there is little scope for using this provision in the code since most import deals have invoicing with them.

The controversial issue of Gatt import valuation came up for discussion in Geneva recently during a meeting of one of the Gatt negotiating groups set up for the Uruguay round. An Indian delegation took part at this meeting. According to information available at N. Delhi, the response to the Indian proposal to change the code was positive.

The Gatt code has created problems of underinvoicing mainly for India and other developing countries which maintain a relatively high customs tariff regime.

In view of this, there is a tendency among importers to reduce their customs duty burden by underinvoicing their imports in collusion with their trade partners.

Sources at Delhi say that the Gatt code apparently did not take into account such a problem which developing countries with high tariff structure would face.

From the Gatt point of view, recognising the invoice as the only authoritative basis for determining the value of imports was aimed at simplifying and rationalising trade norms all over the world.

However, the Indian authorities have now realised the limitations of the code and want Gatt to change the code in such a manner that an importing country becomes free to determine the value of the imports and need not tre invoice as the only basis for such uation.

---

## GITCO PLAN

Gujarat Industrial and Tech Consultancy Organisation (GITCO entered the field of technology tra and technology tie-up for medium large industries for the purpose of moting sunrise industries in the s

As part of these efforts, GITCO planned a 13 day technical tour of S East Asian countries viz. Hong K Taiwan, Korea and Singapore active support and assistance from t and industry promotion bodies of th countries. For this purpose, 50 to 60 jects having relevance to Indian co tions and market potential have b identified.

The South-East Asian Countries, p ticularly Taiwan, Korea, and Ho Kong have emerged as major centres technological advancement in a num of industry sectors such as electroni plastics, textiles, apparels and clothi industry, chemical and pharmaceuti industry etc. The relatively economic cost of securing appropriate viable tec nologies have made these countries major source for securing technologi for India.

GITCO has also tied-up with th industry and the trade promotion bodi of these countries for the delegation meetings and discussions on specif projects.

During the tour the company ha arranged for a visit to ''Seoul Interna tional Trade Fair 90'' (SITRA-90 being organised at Seoul in Kore between October 30 to Nov 5, 1990.

A team of senior professionals from GITCO would accompany the delegation in order to provide necessary technical assistance for the project tie-up.

# 40 pc fall in foreign tie-ups in 1989

The year 1989 saw a near 40 per cent op in number of foreign collaborations Cs) approved according to the information provided by the Directorate eneral of Technical Development GTD) to the Parliamentary Consul- tive Committee meeting on science d technology on July 23.

The reconstituted 16-member consul- tive committee, as against the 30-odd rong one of the previous government, et for the third time. The committee ad an agenda on "Technology Gen- ation and Absorption for Industrial nd Rural Sectors".

The DGTD report says that as against 57 collaborations in 1988 only 605 ere approved during 1989. Soon after he liberalisation policy of the govern- nent was announced, the number of Cs peaked at 1,041 in 1985. In the fol- owing years the figure hovered in the ine-hundreds. The DGTD report has, owever, failed to identify the reason for his trend.

From the country-wise data of the DGTD it was apparent that collaborations with the United Kingdom showed a drastic decline of more than 53 per cent followed by France and Switzerland with a drop of nearly 50 per cent during the last year. In case of the USA and Japan the drop was about 36 per cent.

A sectoral analysis presented indicated that FCs in the area of industrial machinery dropped by more than 65 per cent. In the area of electronics and electricals, where the maximum number of technology transfers occurred in recent years, the decline was over 44 per cent. In the area of chemicals, however, there was a spurt of about 22 per cent.

Technology payments — in the form of lumpsum payments, dividends and royalties in recent years before this drop, had been estimated at Rs. 500 crores per annum. The fall in payments for the year 1989 was not provided.

On technology absorption, the DGTD has this to say. Though, as a result of FCs production technology had been acquired, in most cases resulting in indigenous production as well as import substitution, yet there was little technology absorption in the area of design capability which could result in upgradation of existing products.

Commenting on the import of the four-year-old Technology Absorption, Adaptation and Improvement (TAAI) plan of the government, which was applicable to FCs with payments exceeding Rs. 2 crores the DGTD observed that, of the 109 cases which came under the plan, only 20 proposals were received by the ministry.

The reason for this, according to the DGTD, was the poor implementation of FC proposals in terms of actual signing of agreements followed by technology payments, technology transfer and production technology.

Specifically, in the case of the modern automobile industry, technology transfer and its absorption became difficult because often the foreign company itself was a buyer of some critical components from third parties the DGTD noted.

The DGTD also stated that in quite a few cases, further extensions for collaborations were requested even though foreign technology was available for 10 years or more. The reason advanced in most cases was apparently the need for an upgraded version of the product. While due care and control is excerised in such cases, there is no affirmative action which would dissuade the parties from seeking such extensions" the DGTD has said.

Despite all the above the directorate, however, still has a good word for the recently announced liberalised industrial licensing policy. The DGTD was of the opinion that the new policy may make the environment competitive and in order to survive the units would have to go in for technology absorption and development in a time-bound manner.

The department of scientific and industrial research (DSIR) in its presentation at the meeting observed that the import of capital goods was rising rapidly. These formed the single largest item, accounting for 25 per cent of total imports, in the country's import bill.

The largest share was of the chemicals sector, followed by engineering, electronics and man-made fibres. Export of capital goods, which usually accounts for about 2.5 per cent of our exports and mainly to developing countries, was on the other hand, on the decline.

The Prime Minister, Mr. V.P. Singh, who is the minister for science and technology left for Moscow on July 23 and did not attend the meeting. He was slated to be the chairman of the proposed apex body which would provide S&T inputs to the planning process. The commitee, therefore, decided that the topic would be discussed again at a subsequent meeting next month, in the presence of the Prime Minister.

---

## MALAYSIA TO PHASE OUT CFCs

Malaysia, the largest user of chlorofluorocarbons (CFCs) in the Asia-Pacific region, has embarked on a vigorous campaign to reduce its dependence on the one-time wonder chemical now considered harmful to the earth's ozone layer. The resource-rich country uses the ozone-depleting chemical in its burgeoning electronics industry. Malaysia recently set up a protection of the ozone layer national committee to draw up strategies to tackle environmental degradation by CFCs and halons, another ozone-depleting chemical commonly used in Malaysia's industries.

# Apex body for quality urged

A national conference on standardisation and quality systems, has stressed the need to set up an apex body for the formulation of national quality plan and co-ordination of all quality-related activities.

The two-day conference, organised by the Bureau of Indian Standards (BIS), which concluded at New Delhi recently, has also made several other recommendations to create quality-consciousness in the country. There are strong electronic media campaign to focus on the economic benefits of quality, establishment and certification of quality systems as per ISO, (International Standards Organisation) and introduction of incentives for quality excellence in industries.

Formulation of a national policy on procurement of standardised products for public purchases, setting up a national institute of quality management, review of legisation relating to quality of products and services, establishment of quality consultancy services and laboratories for small-scale industries are also part of the recommendations.

Besides, the experts called for harmonisation of Indian and international standards in sectors having high export potential and development of sectoral standards for major sectors like power, fertiliser, oil and cement.

## Quality audit

The participants urged the industry to subject itself voluntarily to some system of independent quality audit to promote the export of goods. This audit should be in addition to the mandatory pre-shipment inspection or certification of goods as required by the purchasers or the law in force.

One such system specifically applicable to electronic products is the IECO system operated by the International Electrotechnical Commission. The system has an additional advantage of mutual recognition by other nations who have joined the elite group.

In the case of government purchases, the conference recommended that the procurement policy should change from lowest quoted price to the concept of lowest total (life cycle) cost, including operation, maintenance and service costs based on meeting customer requirements.

The government, as the largest buyer in the country, should insist on the supplier providing evidence of conformity to quality system standards, it was suggested. Also, the government, as the biggest owner of business in the country should enforce quality consciousness amongst industry and the service sector under its operation.

---

## FOREIGN-AIDED PROJECTS: MACHINERY IMPORT UNDER OGL

The Government has exempted from indigenous clearance import of capital goods for projects being established with external assistance in which international competitive bidding (ICB) procedure is followed.

According to a public notice dated July 20 (No. 43-ITC(PN)90-93) issued recently import under open general licence (OGL) will be allowed in such cases, alternatively, the concerned administrative Ministry would grant an import licence on the basis of the certification of the items covered by ICB procedure. The procedural simplification would be available to all 14 industries or projects as were notified in the import export policy. These are: fertilisers, newsprint and paper, basic drugs, basic technical material for pesticides and weedicides, power generation, transmission and distribution, mineral exploration, mining and benefication, petroleum exploration and production, petro-chemicals upto the stage of polymers, manufacture of profess
grade electronic components, wast
posal recycling and effluent treat
projects and ecological enginee
material handling projects at p
sugar, cement and cement products
modernisation of integrated steel pl

According to sources, the simpli
tion has been made follow
announcement of sugar policy and
Government's decision to allow pri
sector in power generation. The deci
would help expedite import of mac
ery and equipment required for po
generation.

---

## MARINE RESEARCH CENTR
## LIKELY TO BE SET UP IN TN

The National Centre for Mar
Research and Bio-Technology is lik
to be set up in Tamil Nadu. Indicat
this, Dr. Ramachandran, Secreta
Union Department of Bio-Technolo
said, that he had found many places
the State suitable for setting up such
centre.

The proposed centre would be join
set up by the Department of Bi
Technology and Indian Council f
Agriculture Research (ICAR), he sa
while delivering the keynote address
a workshop on Animal bio-technolog
at The Tamil Nadu Veterinary Anim
Science University at Madras.

Dr. Ramachandran said apart fro
the existing four regional centres i
embryo transfer and bio-technology
plans are on to set up a State-level centr
for the embryo transfer and bio
technology. Dr. Ramachandran said th
centre in Rajasthan would contribute t
embryo transfer in camel.

The Union Minister of State fo
Science and Technology, Prof. M.G.K.
Menon, inaugurating the workshop,
called for giving more attention to
animal husbandry for contribution to
food since hitherto cereal production
was receiving most of the attention

# U.S. NRIs to help development of biotechnology

The Department of Biotechnology, overnment of India, has entered into understanding with an NRI organi- tion in the U.S. known as IDEAS ndian Descendant Engineers and Sci- tists) for technology transfer, partic- ation of overseas Indians in joint ntures and for establishing a science- dustry consortium in biotechnology.

In an interview Dr. K.M. Nair, president, IDEAS, said in response to the quest made by Mr. S.L. Gowindwar the Department of Biotechnology, EAS formed a technical committee mprising nine top biotechnologists orking in universities and industries cross the U.S. to help the Ministry of cience and Technology in matters cluding preparation of a directory of RIs. A large number of scientists, chnologists and engineers trained in dia had migrated to the U.S. and other estern countries where they had found crative opportunities to pursue. Most f them would like to see their country merge as one of the prosperous nations the world. This feeling had impelled me of them to form the group IDEAS, r. Nair said.

IDEAS would interact with individ- als and organisations in India and xtend counsel and help to them in election and shopping of appropriate chnology and partners abroad. It ould also provide guidance and assis- ance to upgrade science, technology nd industrial base, he said.

### avourable response

Dr. Nair said the organisation had ceived favourable response from NRI ssociations in several countries such as uwait, Dubai, England and Canada ledging their support to help and share nowledge. IDEAS could extend help n areas such as telecommunications, omputer systems, micro electronics, naterial science and a host of other sub- ects. "We identify the technology and cooperation in the U.S. and match them for the benefit of Indian industries in getting the right knowhow", he said. Scientists and technologists in India willing to attend the annual meeting of American Chemical Society, American Ceramics Society, American Physics Society, Society of Hybrid Micro electronics etc. would receive necessary support from IDEAS.

In 1962 there were only 5,000 Indian professionals in the U.S. Now there were more than half a million professionals according to the latest U.S. census. Most of the Indians migrated in 1960s would like to come back. "The Government of India would do well to issue dual citizenship to NRIs, as losing U.S. citizenship would deprive them of several advantages", he said.

### Dual citizenship demanded

Dr. Nair, who works for Du Pont Company said the U.S. Government was willing to let its citizens hold dual citizenship with countries such as Israel, Greece and Italy. If only the Indian Govt. allowed this facility, numerous Indian-Americans would come to India for short stay to help whatever they could for the development of their motherland. He regretted that scientific societies in India during their annual convention charged around $500 from NRIs whereas they charged less than Rs. 500 from Indian participants. "This double standard ould only deprive the Indian participants from sharing the views of their American counterparts", he said. He said Dr. Amar Bhalla of the Penn State University and secretary of IDEAS and Dr. Arun Varshneya of Alfred University, treasurer, would be touring India shortly for establishing regional centres of IDEAS.

## CSIR UNIT TO UTILISE NRI EXPERTISE

The Council for Scientific and Industrial Research (CSIR) has established a separate unit — INRIST — Interface for Non-Resident Indian Scientists and Technologists — to promote a congenial atmosphere opportunities and facilities in India for the NRIs to come and explore possibilities of setting up R and D centres or facilities of important nature to support manufacture of critical items and materials for industry and social sectors. Headed by Dr. S.C. Majumdar, the unit aims at establishing joint ventures in selected areas in collaboration with Indians abroad and involving NRI expertise in mission areas, thrust and emerging, in science and technology. It also plans to bring out a directory on NRI expertise available for consultation.

Besides acting as a focal point for information concerning implementation of various activities, INRIST will also undertake temporary placement of talented Indians back home under its Scientists Pool and Quick Hire Scheme. It also provides opportunities to senior scientists abroad to work in CSIR laboratories up to one year in the field of their interest on a consolidated monthly allowance.

Under the TOKEN (Transfer of Knowledge Through Expatriate Nationals) UNDP-funded scheme, the Government of India will invite distinguished scientists, technologists and engineers from abroad for short-term assignments ranging from 4 to 12 weeks. INRIST will give wide publicity in foreign countries about symposia and workshops scheduled to be held in different parts of the country on various disciplines to draw the attention of the NRIs for their participation and also to provide a forum for exchange of views towards making of concrete plans for various developmental science and technology projects in India.

The unit will also extend [illegible] in providing facilities such as travel support and hospitality to NRIs who visit India.

FOR YOUR REGULAR REQUIREMENTS OF

**BETA NAPHTHOL**

*Manufactured by*

**M/s. Eastern Naphtha-Chem Ltd.**

Contact:

**M/s. SPAN INTERMEDIATES**

6th Floor, Mustafa Building, Sir P.M. Road, Bombay 400 001.

**Tel: 314099** **Telex: 011-86836 SPAN IN**

---

Now Available Regularly

**BEST QUALITY**

**ORTHO DIANISIDINE BASE**

**(Fast Blue B Base)**

***Export Enquiries Are Solicited***

CONTACT:

**P. G. Chemicals Pvt. Ltd.**

166, Nagdevi Street, Ismail Manzil, 1st Floor, Bombay 400 003

**Phones: 322303*342754**

---

FOR YOUR REQUIREMENTS OF BULK DRUGS SUCH AS

**Chloramphenicol Powder I.P.**
**Chloramphenicol Palmitate I.P.**
**Piperazine Citrate I.P.**
**Piperazine Hexahydrate I.P.**
**Piperazine Phosphate I.P.**
**Piperazine Adipate I.P.**
**Potassium Citrate I.P.**
**Sodium Citrate I.P.**
**Aminophylline I.P.**
**Potassium Iodide I.P.**
**Iodine I.P.**
**Diethyl Carbamazine Citrate I.P.**
**Sodium Iodide**
**Erythromycine Stearate I.P.**
**Erythromycine Estolate I.P.**
**Erythromycine Ethyl Succinate I.P.**
**Potassium Iodate I.P.**
**Di-sodium Hydrogen Citrate B.P.**

&

**All other BULK DRUGS, kindly contact us at our office address**
**Avail Modvat benefit and No S.T./C.S.T.**

**Gayatri Laboratories Pvt. Ltd.**

**Factory:**
E-64, Road No. 7, M.I.D.C.,
Tarapur, Boisar 401 502.
Dist. Thana, Maharashtra.
Phone: 251124, 257375, 257376, 254335

**Adm. Office:**
26/3, Jay Mahal Estate, Kitchen Garden Lane,
Princess Street, P.B. No. 2273,
Bombay 400 002.

Resi.: S-6282551, R-6825642 Gram:."VIKASHDRUGS", Bombay 400 002.
Telex: 4932 G.L.P.L IN
Export Enquiries Solicited

## OTLIGHT ON

# Biotechnology and Life Sciences (Part-I)

### LANIN PIGMENT PRODUCED BULK GENETIC ENGINEER- G

Ielanin pigment of the skin is get- ; much attention in cosmetics and in nulations of suntan lotions. A Brit- company Abneycrest has recently eloped suntan formulation based on lanin and hydrolysed keratin. British earchers extracted granular melanin m human hair by alkaline hydroly- , for their formulation.

In consequence of the great interest melanin, an American company Bio- urce Genetics has realised the poten- l use of melanin in skin cosmetics. e company developed a commercial ale process for producing commercial antities using genetic engineering and mples are undergoing clinical testing. ie Biosource researchers are expect- g their melanin to be on the market less than 3 years.

One researcher David McGee, plained recently that they had opted r genetic engineering because, when ey began research four years ago, it as the cheapest and safest way to aintain quality control when produc- ng large quantities of melanin. (*New* c., 2/17/90, p. 36).

### UNG CANCER GENE IDENTI- IED

The discovery of a mutant gene in ng tumours could offer new possibil- ties for treating lung cancer. Scientists ave long suspected that some people ave a genetic susceptibility to lung ancer. Now a team of researchers from he Imperial Cancer Research Fund and he John Radcliffe Hospital in Oxford ave found high levels of a mutant form of the so called p53 gene in cells from ung cancers. The p53 gene is normally a tumour suppressor. The mutant appears to be absent from normal cells or other types of tumour cells. The team believes the findings make possible "new therapeutic approaches" to lung cancer. (*New Sc.*, 3/31/90, p. 27).

### NCL BEGINS TO CONTRIBUTE IN BIOTECH RESEARCH

The National Chemical Laboratory, (Pune) is the leading national laboratory in the field of chemistry and allied sciences. In recent years, the Laboratory researchers have begun contributing to biotech research covering plant tissue culture, enzyme engineering and fermentation tchnology.

To-day micropropagation has become the first of the plant tissue culture techniques to acquire commercial significance. Its major advantages are rapid, reproducible multiplication rate under pathogen-free conditions, ability to multiply difficult-to-propagate species and year round production. NCL developed processes based on tissue culture have been commercialised in industry. Those for cardamom may enable India to regain its lost position as the top produced and exporter of cardamom.

NCL's research on the flowering of bamboo plants, has been recently reported in the journal *Nature* and has evoked worldwide acclaim. Recently, NCL researchers have developed a low, molecular weight enzyme called xylanase from a species isolated by NCL scientists. This enzyme is expected to be of great value in the paper and pulp industry. NCL has entered into a collaboration with Iowa State University (USA) and International Paper Corp. of USA and Biocon of Bangalore and Iceland for developing applications for this new enzyme.

In the field of polymeric supports. NCL scientists have developed a methacrylate-based polymer support for penicillin acylase. This immobilized enzyme performed very well when compared to imported enzyme and proved cost competitive as well.

In the field of fermentation NCL has developed a new continous process for fermentation of molasses to ethanol using an efficient proprietary yeast. The process claims lower capital costs vis-a-vis current processes.

### BIOENGINEERED PESTICIDE TO BE TESTED IN USA

EPA has granted an environmental use permit to Mycogen Corp. (San Diego, USA) for its MVP bioinsecticide designed to control insects that attack cabbage, broccoli, lettuce, and other crops.

MVP is the first pesticide developed using r-DNA techniques approved for large-scale field trials in USA. The active toxin in MVP is a protein produced naturally by the bacterium *B-thuringiensis*. Mycogen researchers use recombinant techniques to insert the gene that produces the toxin into another bacterium *Pseudomonas fluorescens*.

The recombinant bacteria are then killed by a process that stabilizes the microbial cell wall, forming a natural biocapsule around each insecticidal protein crystal. When applied to crops, the encapsulated pesticide kills insects that ingest the toxin, after which it biodegrades. Earlier tests showed that its insecticidal activity was greater and longer lasting than that of non-encapsulated biopesticides. (*C & EN*, 3/12/90 p. 23).

### MAPPING OF RICE PLANT'S GENOME TO BEGIN IN JAPAN

Japan is planning a long-term international project to map the rice plant's genome. If approved, the project will begin in 1991, and extend into the 21st century, involving researchers throughout Asia.

During the first 10 years, the project will aim to identify 1000 chromosomal marker genes and develop methods to introduce new genes into specific places. Researchers will then turn to sequencing the more than 100 million base pairs which make up the genome.

The Rice Genome Council drawn from universities and national research institutes had met last February to plan the scheme. The project is likely to win support in Japan, since rice farmers make up the most powerful political constituency in the country. (*New Sc.*, 2/10/90, p. 27).

## HOFFMANN LA ROCHE (SWITZERLAND) TAKES OVER GENENTECH

Last February Hoffmann La Roche of Switzerland, took over by purchase, the leading biotech company Genentech of California, USA. This takeover is the biggest corporate deal of its kind to take place so far in the youthful business of biotechnology.

Genentech has revenues of around $400 million a year which make it the largest biotechnology group in the world. The company sells the world's best selling product of biotechnology, activase, a drug that dissoves clots in blood.

Genentech's research group is well supported financially, and includes some of the brightest researchers. Genentech hopes that the deal with Hoffmann La-Roche will alleviate their financial restraints.

The Genentech researchers can now pursue all of their projects 'with vigor' without the worry that they might not be able to finish projects. (*New Sc.*, 2/10/90, p. 23).

## VEGETABLE OIL GENE CLONED BY RESEARCHERS AT CALGENE (USA)

Improved vegetable oils may be produced in the near future from genetically engineered plants due to successful cloning of a vegetable oil gene by researchers at Calgene Inc (Davis, Calif., USA).

Calgene reports cloning a gene for stearoyl-ACP desaturase, an enzyme that plays a key role in determining the ratio of saturated to unsaturated fatty acids in vegetable oils.

Calgene reports that enhanced expression of the gene could contribute to lowering the saturated fat content of the edible oils. Calgene hopes to market vegetable oil produced by genetically engineered Canola and says it has introduced the desaturase gene into the plant.

The Company will evaluate the engineered Canola plants for altered saturated fat composition in the summer of 1990 and expects field tests by 1991. Calgene estimate current US consumption of edible and industrial vegetable oils at over 15 billion lbs per annum. (*Chem Wk*, 6/6/90, p. 32).

## CULTOR (FINLAND) AND KODAK (USA) ESTABLISH JOINT BIOTECH COMPANY

Cultor Ltd (Finland) and Eastman Kodak of USA signed recently a joint venture agreement in Oct. 1989 to establish a joint venture biotech company.

The new company will employ 300 approximate divisions and Cultor's biotechnical operations. Cultor's biotechnical plants in Jamsankoski and Hanks, Finland, and Kodak's plant in Rochester, N.Y. will be transferred to the new company, which is building a new plant in USA to be completed in 1991. (*Food Technol*, 2/1990, p. 66).

## 'BIOELECTRONICS: A TECH NOLOGY IMPACT REPORT' FROM FROST & SULLIVAN

As the limits of silicon chips
being approached for comput
research is being carried out into
possibility of building electronic c
virtually molecule by molecule, us
the technology of bio-engineering
prototyping and mass production.

This is subject of a recent report fr
Frost & Sullivan Ltd. (A 4, Grosve
Gardens, London, SW1WODH U.
on 'Bioelectronics: A Technolo
Impact Report'. This report also lo
at the broader field of molecular el
tronics.

The ultimate bioelectronic fanta
would have genetically engineered ce
churning out microscopic protein co
puters. But in fact, not only has
molecular scale device been built, the
are also strong doubts about the mark
for such alternative electronics. Desp
its theoretical limitation, convention
technology is advancing so quickly th
'biochips' will be hard pressed to ove
take them in the foreseeable future.

More likely, viable biocomputer
would fill a niche where silicon is wea
such as neutral network computing i
artificial intelligent applications. In an
case, the biochip is likely to remain a
academic enterprise for years to come

Bioelectronics' great success story t
date, says the Frost & Sullivan Repor
is biosensors which exploit the abilit
of individual proteins to generate
signal in the presence of certain substances. Since proteins are unstable biosensors are typically disposable. Self
regenerating biosensors are possible, but
the added cost and complexity may only
make sense in process control industry
applications. Other potential biosensor
applications foreseen by Frost & Sullivan include measurement of biological

gen demand (BOD), the evaluation nvironmental contaminants such as ticides and monitoring for evidence biological or chemical warfare.

### ROPEAN BIOTECH COMPA- ES CALL FOR A COHERENT & NAMIC BIOTECH POLICY

Seven major European companies rned the European Commission that ess it gave priority to a coherent and namic community policy on biotech- ogy, future European competitive- s would be at risk. They warn that rope is falling behind the USA and an in the establishment of effective technology policy and therefore in development of biotechnology itself. eady this gap is increasing and Euro- an talent and investment is emigrat- to more favourable political vironments.

### N UPDATE ON WORLD ARKET OF INDUSTRIAL NZYME

Enzymes and ferments for agro-food d pharmaceuticals are undergoing ep changes in advanced countries, urred by constant technological inno- tion applications. Progress in genetic gineering and enzymology is gener- ing new uses and developing new tential applications for micro orga- sms and enzymes in the biotech indus- y.

The enzymes and ferments industry n be divided into four main groups of tivities:

) Industrial enzyme
) Bakery yeast
) Lactic ferments (yeasts, bacteria and oulds)
) Miscellaneous ferments (acetic, alolactic etc).

Currently, the world industrial nzymes market is aroung $625 million with USA, the largest sector. Applica- ionwise, the world enzyme market may e categorized as under:

| Application of Enzyme | Per Cent Share |
|---|---|
| Detergents | 33% |
| Sugars & alcohol | 24% |
| Cheese | 16% |
| Fruit & Vegetable juice | 7% |
| Textile and leather | 5% |
| Baking | 4% |
| Brewing | 4% |
| Others | 7% |

(*ECN*, *6/4/90, p. 24*).

### JAPANESE/US VENTURE FOR DEVELOPING & MARKETING BONE MORPHOGENETIC PROTEIN

Consolidations within the biotech industry continues apace with the recent announcement that the US-based Genetic Institute is entering into a joint venture with Yamanouchi Pharmaceutical co. Ltd., one of Japan's largest drug companies. The two part agreement involves the formation of a separate company for the commercialization and marketing of Genetic Institute's genetically-engineered bone morphogenetic proteins (BMPs) in Japan and setting of a partnership to support the development and commercialization of BMPs.

In the carefully drafted agreement, Genetic Institute will retain worldwide manufacturing rights and US marketing rights to its BMP products and will receive a 50% share in the profits from the sale of its BMPs in Japan.

Genetic Institute expects that by the late 1990s up to one third of Genetic Institute's business could be in the bone area, worth in excess of $2000 million worldwide. Bone morphogenetic proteins have been shown to induce new cartilage and bone formation. They have potential as a substitute for existing bone-graft materials in fracture healing and in the treatment of bone loss associated with peridontal disease and certain cancers.

BMPs are in the pre-clinical testing phase of development and products are not expected on the market for some years. Genetic Institute has forged close business ties with Japanese companies-Chugai Pharmaceuticals, and Santory as well as its new joint venture with Yamanouchi. (*Nature*, *55/24/90, p. 280*).

### DRUGS FROM PLANTS ON THE HORIZON

Important pharmaceuticals such as anticlotting agents and growth hormones could soon be produced on a large scale by genetically engineered plants. Plant Genetic Systems (PGS) of Belgium is the leading biotech company in this field. Its researchers have recently produced pharmaceutical peptides in the seeds of oilseed rape, using a technique developed jointly with scientists at the Univ. of Ghent.

The company foresees itself as a 'molecular farmer'. It plans to grow transgenic plants and sell the peptides to drug companies. It reports that an agreement has already been reached with a major pharmaceutical firm. Although animals are also being engineered for the production of pharmaceutical proteins, PGS believes plants are more cost effective. The extraction and purification processes are also reported to be efficient.

### WORLD'S FIRST BONE MARROW BABY

A Californian woman announced last February that she had given birth to a child whose bone marrow cells are suitable for transplanting into the bones of an elder daughter who suffers from leukemia. The woman and her husband have openly acknowledge that the new baby was deliberately conceived as a potential cell donor for their 17-year old daughter.

Their action has been supported by an organization called Life Savers Foundation of America, which currently has 9000 Americans on its books seeking potential donors for bone marrow transplants. But the couple's actions have generated a fierce debate on the medical community over the ethical implications.

Already some doctors have refused to provide genetic screening to parents who admit that they are looking for particular characteristics in their children and have made it clear that they are prepared to abort foetuses lacking these characteristics. (*New Sc.*, 2/24/90, p. 26).

---

### AN ARTIFICIAL SYNTHETIC MOLECULE SHOWN TO REPLICATE ITSELF

The first synthetic molecule that can form copies of itself has been reported from USA. The new molecule is far simpler than biological molecules that can replicate themselves, such as DNA. The researchers who synthesized it report that 'at best this can be regarded as a primitive sign of life'.

The researchers at the Massachusetts Institute of Technology report that their compound, an amino adenosine triacid ester (AATE) acts as a 'template' which combines moleculár fragments to make a copy of the original compound. The process is very similar to that used by DNA. The different is that the biological copying usually needs an enzyme to make it work.

To prepare their compound the researchers reacted a compound derived from an ester with amino adenosine. The researchers dissolved these components in chloroform and added triethylamine, so that the reaction can occur conveniently at room temperature. In the reaction, the molecules are joined to make AATE.

AATE copies itself by attr
another ester molecule to its ader
end and an amino adenosine mo
to its ester end. These two molecul
react to form another AATE. The
ing process works because of a ki
weak bonding, known as hyd
bonding. Each end of AATE recog
its counterpart by latching on with
of hydrogen bonds. Once the two
ponents are secured, they can
together to form a new molecu
AATE.

Researchers say, that in theory,
tions could be self replicating if the
of the molecule being formed can a
each other. The researchers are
extending their research to larger
tems of the kind used in nature —
example, those in which peptide
formed using information from a
plate of nucleic acid. (*New Sc*, 4/2
p. 38).

The reliable source of
International Quality
PIPERAZINES in India
DIAMINES

Another First. After Ethyleneamines.

DIAMINES AND CHEMICALS LIMITED
International Quality with Indigenous Ingenuity.

■ PIPERAZINE (PIP)
Intermediate for
Pharmaceuticals
Rubber Accelerators
Corrosion Inhibitors
Surface Active Agents

■ AMINO ETHYL
PIPERAZINE (AEP)
Epoxy Curing Agents
Corrosion Inhibitors
Asphalt Additives
Emulsifiers
Pharmaceuticals
Surfactants

**Ahmedabad (H.O) :**
1. National Chambers, Ashram Road,
Ahmedabad - 380 009
Phone : 409626 Gram : DIAMINES
**Baroda (Works) :**
Plot No. 13, P.O. Petrofils - 391 347.
Dist Baroda
Phone : 73305/406. Gram : DIAMINES.
Telex . 0175-352 DACLIN
**Bombay Office :**
85. 'C' Wing, Mittal Towers, 8th Floor,
Nariman Point,
Bombay - 400 021. Phone : 2029507.
Gram . CELAGAR

Navnit/306/

# Food & Pharmaceutical Technology in Perspective

### BILIZED RICE BRAN MAR- 'ED IN USA AS A FLAVOUR- AGENT

stabilized form of rice bran under rade name 'Fibre Rice' has been ntly marketed in USA. It provides tural sweetness and slightly nutty our to a variety of products includ- aked goods, breads, biscuits, cakes, kies, muffins, pies, pancakes, cer- , snacks and extruded foodstuffs. bran is derived from the outer layer rown rice. By stabilising the rice under heat and pressure free fatty ls are neutralised thereby preventing cidity in the bran.

Stabilised rice bran is reported to ver cholesterol and has high levels of re, potassium, iron, proteins, and Vit Its water holding capacity allows for y incorporation into product formu- . For a copy of a 4 page brochure 'A fect Blending of flavour With Nutri- n' that describes the nutritional ben- ts of rice bran, write to: Farmers' ce Corporation, P.O. Box 15223, Sac- mento CA, USA. (*Food Technol* 1990 p. 102).

### NTEGRATED OILSEEDS OLICY PAYS DIVIDENDS IN NDIA

The oilseeds production having gone p the Government of India hopes to ave nearly Rs. 300 crores in foreign xchange in the imports of edible oils. dible oil import has been brought own by 80% and there has been an ncrease of 200% in the export of oil- eeds derivatives.

The integrated policy evolved by the Oilseeds Mission has paid dividends. The processing and post harvest technology support, strengthening of services to the farmers and support to the processing industry led to all round growth in the edible oil sector. (*The Oil & Oilseed J.* Oct-Dec. 89, p. 6).

### FISH FARMING THE OCEAN FOR PROFIT ON THE HORIZON

An Indian businessman Sasikumar Nair has teamed up with a Swedish industrialist Walter Hoff to promote a novel concept of farming the ocean, Fishes are planted, given time to grow and mature and later harvested with modern technology to reap a whopping profit.

The project which consists of actually farming the ocean is a new concept in farming. Cultures of the choice of fish most viable to any given region is planted and given the necessary time to grow and mature. The resultant crop, like any well husbanded harvest more than justified the efforts. Prototypes in Iceland, Scotland, Ireland, Greece and in various countries in South America have yielded highly satisfying and economically lucrative results.

Each 'ocean farm' is a unit, in a way like an oil rig, moored offshore, in the big sea, it is semi-submersible in design, comprising of a submerisable pontoon, with a cage, a stabilising buoyancy structure, a three point mooring system and a computerized feeder unit which can operate independently, for protected periods. A rotating gangway provides access to the farm, even in the roughest weather.

Ocean farming on Farmocean AB as the project is called, has an inalienable philosophy that the fish thrive best in their natural and uninhibited bhabitat. Hence the Farmocean cages are designed to suit the natural conditions of the water, with regard to temperature at various depths, the strength of the currents, the density and contents of oxygen and so on, most suitable to the respective species of the fish under cultivation.

To give an example, salmon is a cold water fish that thrives in somewhat turbulent water, rich in oxygen. Farmocean experienced growing salmon in much colder water, but with improved salinity and fodder, and succeeded through the drop in temperature, to eliminate diseases common to salmon. This resulted in a significant improvement in the quality of meat and even the size of the fish.

Initially, the ocean farmers faced a nasty snag, unless the cages were installed very close to the shore, in sheltered waters, they broke up long before the winter storms set in. Bearing these facts in mind, engineers of the Gothenburg University's marine institute at Halmstad (Sweden) and the Swedish Maritime Research Centre (SSPA) started a research project, a few years ago, aimed at designing an offshore fish farm that would provide the best possible environment for the fish, under production, as well as a safe, practical and profitable investment for the fish farmer. The result was the Farm Ocean 3500, with vastly improved technology.

Extensive tests with a fully instrumental 1:10 scale model, in a large wave tank at SSPA establishes the characteristic properties of a semi-submerged mooring platform with exceptional stability and low mooring forces. As production costs for a moored platform at sea increase very rapidly with wave height, the farm has been designed for a maximum wave height of 5 metres — a condition typical for a storm-stricken semi-sheltered coastal area. A typical ocean farm is operated in 25 metres of water, having 25 metres in diameter and an operational drought of 15 meters. During inspection and harvest the draught can be reduced by deballasting the pontoon and by raising the net floor with a hoisting system. The computer regulated and controlled food dispenser takes tons of pelleted dry fish food. Sasikumar Nair and Walter Hoff are very optimistic about the chances of ocean farming off the coast of India. As a stepping stone, they have an eye on Goa. They, very convincingly point out the manifold advantages and project has in store, for any region it is based in.

The rig or the platform itself, besides the prototype, can be manufactured locally, or if economically unfeasible at the initial stage, assembled locally. An essential infrastructure has to be organised from the local human resource. This includes recruiting and training of 'farm hands' the setting up of a factory to produce the dry fish pellets, the maintenance of the platform, including the specially designed and developed work boat that has an onboard feed transportation or spray feeding system and last but not the least the fish-processing plant. The fish processing plant is based onshore. If there are many platforms (in a very big operation) a factory boat that moves from platform to platform will be ideal. (*Sunday Mail* 6/10/90).

## A NEW POLYMER GEL MATERIAL OPENS UP PHARMACEUTICAL RESEARCH IN NEW DIRECTIONS

A new material made by Japanese researchers may open up the possibility of self-focussing contact lenses and implants inside the body that release drugs on command. The material, a polymer gel, behaves like a slow but dependable muscle; it contracts when given an electrical charge.

Scientists are interested on converting chemical energy directly into mechanical energy — as a natural muscle does — because the process is much more efficient then mechanical motors. Muscles make use of more than 50% of the energy they consume. Steam turbines and internal combustion engines have efficiencies of only around 30%. Artificial muscles should also be tougher and more compact than mechanical engines. A research team under Yoshioitio Osada at Ibaraki Univ (Japan) have come close to this goal.

The Osada team has synthesised a gel called PMAA, short for poly (2-acrylamide-2-methyl-1-propane sulphonic acid), which contracts and dilates reversibly when given an electrical stimulus. An artificial muscle made from the material contracts at the rate of 0.4 cms per hour when not under load. This slows to 0.1 cm an hour when lifting 3.5 grams.

When lifting heavier weights, however, the rate of contraction speeds up. The muscle lifted 22 gms six times as fast as 5.5 gms. Osada reports that extra stretching under load actually increases the electrical charge going to the gel.

The group also reports making a porous membrane from the material which is able to store liquid in tiny pores. When subjected to a direct electrical potential of around 15 volts, it squeezed the liquid out. This principle, Osada said, could be used in implants into the body which could be made to release substances such as insulin into the blood stream. Diabetics who use insulin normally have to inject it into themselves at least once a day.

The team is now working on improving the gel's performance, to make it faster and more powerful. It is also studying similar gels for the same 'mechano-chemical' effects. 'We have some feeling that we are getting results' Osada said. He stresses that the research is still on a long march before practical applications can come out. These mechano-chemical devices may be of use in space, where power for conventional motors is in short supply.

This research according to Ibaraki may also have applications in the limit for 'intelligent' materials — sub
that change their form or sh
response to outside stimuli.
groups in Japan are working on th
cept, with the goal of producing
ials such as artificial bone that can
(*New Sc.*2/10/90 p. 35).

## FDA APPROVES FIRST BIO GINEERED FOOD IN USA

For the first time, FDA has app
a bioengineered product generall
ognised as safe for use in food. Th
food to be used in producing chees
other dairy products, is a preparati
the enzyme chymosin. Chymosin
principle active component in renn
extract of the fourth stomach of ca
Calf rennin has traditionally been
to coagulate or curdle, milk in ma
cheese.

The newly approved chymosin
paration is the product of a scien
process that used recombinant D
techniques. The chymosin gene of
calf is inserted into a strain of the E.
K-12 organism. This gene then dire
the E. coli cell to make chymosin

FDA determined that the bio engi
ered enzyme is identical to the natu
chymosin in calf rennet and that
manufacturing process does not int
duce any unsafe impurities. E. coli
12 does not survive well outside of
laboratory and, there have been
reports of it having caused illne
Moreover, the bacteria are destroy
during the manufacturing process. (*FD*
*consumer*6/1990 p. 2).

## SULFITES BANNED ON FRESH POTATOES IN USA

Sulfites no longer can be used o
commercially marketed fresh potatoe
in USA. The FDA's latest sulfite pro
hibition announced last March applie
to fresh peeled potatoes that are serve
or sold unpackaged or unlabeled. It doe
not include frozen, canned or dehy
drated potatoes.

led potatoes are often treated with s to keep firm and white during ution to fast food and other rants, which serve them as french cottage fries and hash browns.

A has received 1000 complaints in of adverse reactions to sulfites 1985, when the Agency began a l reporting system for foods. In ptible people sulfites can provoke ness, cramps or wheezing. Occa- lly, sulfites can also cause brea- difficulties and collapse. This sulfite ban follows a 1986 action biting sulfite use on fruits and tables in salad bars. (*FDA Con- r*, 6/1990, p. 3).

## NSUMER'S ASSOCIATION ) EXPRESSES DOUBTS ON ADIATED FOODS

ccording to Consumer's Associa- (UK), the ideal way to render food is not to find a way of killing off gerous organisms in it, but to pro- food that has little or no danger- contaminants in the first place. In rast proponents of food irradiation that the ideal way to render food r for human consumption would be nd a process that kills off all the bac- a and other organisms that could n anyone who eats it.

he danger of this position is that it fts the responsibility for the produc- of safer, wholesome food away n the producers because they will ieve contaminated foods will be dered 'safe' by irradiation at the last ge in the process, so their hygiene ndards do not matter.

Further, there are also a number of tstanding questions about the safety food irradiation itself. Its effects on ckaging materials, food additives and sticide residues etc.

According to the Consumers' Asso- ation of Britain, irradiation can be ed only on a limited range of foods: it is no good for meat pate, or worse still for eggs. Even then poultry producers have doubts that chicken can be irradiated sufficiently without making it inedible. Other question is : What are the commercial advantages to prolonging shelf-life and who benefits from this, consumers or producers?

According to Consumers Association, irradiation may be slightly less risky way to treat herbs and spices that are currently subjected to ethylene oxide gas. (*New Sc.*, 2/10/90, p. 68).

## AN AUTOMATED SYSTEM BASED ON GAS CHROMATOGRAPHY SCREENS FOODS FOR PESTICIDE RESIDUES

A fully automated system that increases throughput and eliminates the need for confirmatory analysis for pesticide residues has been marketed recently by HNU Systems Inc., Newton, Mass (USA).

The system uses a simultaneous dual-capillary column gas chromatography (GC) analysis and comes complete with a software package that calculates retention indices and compares them with those in a user-defined library. The system is reported to be capable of identifying pesticide residues to 99.9% certainty. (*Chem Eng*. 5/1990 p. 80).

## FDA IN USA CALLS FOR NATIONWIDE VOLUNTARY RECALL OF L-TRYPTOPHAN CONTAINING DIETARY SUPPLEMENTS

The FDA in USA is seeking a nationwide recall of L-tryptohan containing dietary supplements because the amino acid has been linked to a rare blood disorder called the 'Eosinophilia myalgia syndrome'. The syndrome causes white blood cells to increase to abnormally high levels and it produces severe muscular and joint pain with swelling of arms and legs. It may also cause fever and skin rash.

An estimated $60 million of L-tryptophan supplements are sold annually most in health food stores and supermarkets. FDA admits that it does not know how the disorder is caused but said there is a 'strong, virtually unequivocal link between L-tryptophan and the syndrome.

One possibility suggested by the FDA: the possibility that some lots of the supplement have been contaminated. Most L-tryptophan is made for the US market by four Japanese Companies. (*DCI*, 2/1990, p. 80).

## VEGETABLE DRINKS DEVELOPED BY BEIJING FERMENTATION INDUSTRY (CHINA)

Beijing Fermentation Industry has recently reported the development of tasty vegetable drinks. Made from such vegetable as cucumber, fresh ginger, celery and tomatoes. Last November the drinks passed appraisal by experts from wine organizations. (*China Foreign Trade* 12/1988, p. 112).

## CETUS WINS DOXORUBICIN BATTLE

In the ongoing patent dispute over the widely prescribed antitumour drug doxorubicin, an administrative law judge of the International Trade Commission has issued a determination that the importation and sale of the drug by Cetus does not infringe on U.S. patent rights of Erbamont (Stamford, CT), the U.S. affiliate of the Italian firm Erbamont N.V.

The decision allows Cetus —which began selling a generic form of doxorubicin in May 1989 — to keep marketing the drug in the U.S. In 1989, Erbamont filed a complaint with ITC alleging Cetus was importing doxorubicin from Italian supplier Sicor, which it says was infringing on a process patent licensed to Erbamont. Doxorubicin has sales of over $160 million in the U.S.

* ACTIVATED ALUMINA BALLS, GRANULES & POWDER
* MOLECULAR SIEVES TYPE 3A, 4A, 5A & 13X
* ACTIVATED CARBON GRANULAR & POWDER
* SILICA GEL WHITE & BLUE
* SILICA GEL FABRIC BAGS
* PRECIOUS METAL CATALYSTS & SALTS like Pd, Pt etc.

RASHMI DHABUWALA
(Authorised Signatory)

**R.V. CORPORATION**

9, Uttam Chambers, 39, Syed Mukri Street, Katha Bazar, Bombay 400 009.
**Phones: 325440/341184 Resi.: 6366147 Gram: AMARJYOT, Bombay 400 009.**

**RASHMI DHABUWALA has resigned as partner from M/s. Catalysts & Chemicals, Bombay 400 056.**

AVAILABLE IN BULK & SMALL PACKING

**SULPHURIC ACID 98% & 70%**
**CHLOROSULPHONIC ACID**

**DILUTE NITRIC ACID 58**
**ALUMINA SULPHAT**
**FERRIC/IRON FRE**

Please Contact:

**SDBB CHEMICALS (INDIA)**

*Head Office:*
Satnarayan House,
Section 17, Ulhasnagar 421 003
**Phones: 78238/75992/70096**

*Branch Office*
Ganga Jamuna Cinema Bldg.
Tardeo, Bombay 400 00
**Phones: 4922970/494460**

FOR YOUR REQUIREMENT OF

**META CRESOL 40-42%**
**PURE META CRESOL 98%**
**PURE PARA CRESOL 98%**
**SODIUM SULPHITE 78-80% & 85%**
**ORTHO CRESOL 98%**
**ORTHO CRESOL 90%**
**RESORCINOL**
**METANILIC ACID**
**META TOLUIDINE**

**Manufactured by: ATUL PRODUCTS LTD.**
PLEASE CONTACT DISTRIBUTORS/AUTHORISED AGENTS

**CRESCENT CHEMICALS**

**Regd. Office:** 404, Faiz-E-Qutbi, 375, Narsi Natha Street, Bombay 400 009.
**Tel.: 342231/348096/348305 * Telex: 011-5412 CRES IN**

**Sales Office:** 56-B, Sanjay Building, 5 Mittal Estate,
Andheri Kurla Road, Bombay 400 059.
Tel.: 6322697/6342320/6329110/6322136

# Science Briefs

## MPLE PROCESS FOR IODISING LT

The Bhavnagar-based Central Salt 1 Marine Chemicals Research Insti- e has developed a simple economi- ly viable process for iodising mmon salt by the "Submersion pro- ss", reports the journal "Research d Industry".

After experimenting with several dine compounds, it has been found at potassium iodate is best suited for disation of salt because of its relative ability even in tropical climates. It has en reported that under adverse con- tions of moisture, heat and sunlight, e iodine content of salt iodised with otassium iodate, remains relatively able compared to potassium iodide hich decomposes and imparts a yellow olour to salt with substantial loss of dine. An expert group has said there no danger of toxic effects if iodates re substituted for iodides in salt iodi- ation.

In the manual submersion process, alt with 96 per cent sodium chloride ontent is spread out in a submersion ank to make a layer of height 24 to 30 m. The salt is then submerged in a sat- rated salt solution in which a predeter- nined quantity of potassium iodate is lissolved. The exact quantities of the odating agent to be added depends on he chemical as well as physical property of the salt.

The submerged salt is raked manually for a few minutes and excess brine is discharged to the settling tank. The wet salt is collected and heaped in the tank where it is allowed to drain for about eight hours. The drained liquor is also collected in the same settling tank. The settled brine is pumped back to the storage tank and recycled.

The heap after draining is spread on the same platform for solar drying for about 18 hours. The final product contains 30-35 ppm of iodine. Mechanised submersion process is used for large scale continuous production. The plant consists of belt conveyor, screw conveyor, centrifugal pumps and a grinder of suitable size. Cement tanks and platforms are also constructed. The raw salt is graded and fed to the hopper of a counter current screw conveyor. The saturated iodated brine is continuously fed to the base of screw conveyor on salt.

The wet iodated salt containing about 20 per cent brine is dragged by the screw conveyor to the discharge end where it is dropped on a continuously moving belt-conveyor which conveys it to the draining platform. The salt is allowed to drain for 6-8 hours and spread for solar drying for 16-18 hours.

Some of the advantages of the submersion process are: (a) It is extremely simple and is suitable for both small and large scale production, (b) Electric power requirement is comparatively low, (c) The process is applicable to any variety of salt like Kurkutch, Badagara etc. (d) The complete mass of salt is submerged in a weak solution of iodating agent, so uniformity of distribution of iodine is well maintained, (e) Once the quality of salt to be iodated is known, single point control is sufficient for quality control, (f) To a certain extent, superficial magnesium impurity of the salt crystals can be removed by controlling the magnesium content of the process solution. This helps in increasing the purity of the final product which also increases the stability, and (g) The salt crystals can be ground after iodization without loss of iodine.

**-- P.T.I. Science Service,**
**July 16-31, 1990**

## MACHINE TO CLEAR FIRING RANGES

A machine that collects spent projectiles from firing ranges and believed to have widespread commercial potential has been developed in Australia.

The machine has been designed to clear target ranges after air-to-ground target practice by fighter aircraft. After further modifications the new machine will be able to clear rocks from paddocks and developments sites with much greater speed and effectiveness than is currently possible, reports an Australian science newsletter.

Towed behind a tractor, the machine scrapes up soil to a depth of 300 mm, puts it through a series of screens and places objects into a bin at the rear and returns the soil to the ground. The machine can collect objects up to 30 mm in diameter and is said to operate quickly. Agricultural applications are also envisaged with the machine.

**-- P.T.I. Science Service,**
**July 16-31, 1990**

## PLASMA ORNAMENTS

A unique method of producing facial and decorative materials has been developed in the Soviet Union using plasma, reports APN. In plasma "paintings" the role of paints is played by fire, while instead of the brush the artist uses a plasmotron burner. The result can be not only a painting but also decorative tiles with colourful patterns or ornaments.

The principal element for plasma ornaments is glass silicate, a new decorative material. Glass silicate is a laminate material consisting of quartz sand and glass with metal oxide adddditive, which has a porous texture on the back, due to which it sets fast on any even surface.

After thermal treatment with a plasma jet, annealing in a special mode and mechanical trimming of the edges, very beautiful decorative tiles come out. They are absolutely smooth on their face side and seem to be covered with a very fine, transparent film protecting a pattern of incredible freshness and concentration of colours. These colours do not tarnish with time, and the material itself is resistant to aggressive media. Glass silicate has a linear expansion ratio which is practically identical to that of concrete, while in terms of its physical, chemical and mechanical properties, it is superior to the traditional natural materials like granite, marble and malachite used in construction and architecture.

Other than quartz sand and cullet, the mixture can contain different industrial wastes such as slag, ash and fibreglass materials. The use of wastes substantially broadens the raw material base for the introduction of plasma ornaments in the practice of monumental and decorative art, architecture and construction and provides additional opportunities for saving energy and mineral resources.

**-- P.T.I. Science Service,**
**July 16-31, 1990**

## GAS-POWERED BUSES

A Netherlands road vehicles research institute has developed bus engines that run on natural gas, reports ''Applied Research''. The institute performed an engine optimization study for the experimental buses numbering seven which are already on the road. The pre-run study helped in fitting the seven engines with components necessary to run on natural gas.

The advantages of gas engines compared with diesel engines are: lower emissions of all restricted exhaust fumes, lower noise levels and longer service lives. The main disadvantage is the large number of tanks that have to be fitted underneath the bus to guarantee an acceptable driving radius.

The discharge of carbon monoxide and of soot particles from gas engines is normally well below permissable levels. However, an oxidation catalyst is generally used to reduce the emission of non-combusted hydrocarbons sufficiently. A further point in favour of using natural gas as a fuel is the lower carbon dioxide emissions compared with diesel. This is due to the fact that the ratio of carbon atoms to hydrogen atoms in methane molecule is lower than in other fuels. As a result, eight per cent lower carbon dioxide emissions can be achieved.

Gas engines differ from diesel engines in that they have an ignition system and a gas/air mixer. In the latest programme, highly specialised gas control and ignition systems have been used, which allow the engine settings to be optimized for each loading condition as a function of the engine speed.

Measurements on the engine bed were used to determine the optimum settings for all combinations of operating conditions. These data were subsequently programmed into the microprocessor control system. As a result, maximum efficency was achieved for minimum exhaust levels.

**-- P.T.I. Science Service,**
**July 16-31, 1990**

## NEW CATALYST FOR METHANOL PRODUCTION

A new generation of methanol synthesis catalysts developed by Britains's Imperial Chemical Industries (ICI) is said to extend the life span of catalysts by at least 50 per cent while increasing the output of methanol and maintaining low levels of by-products from the process, reports London Press Service.

The methanol synthesis catalysts have been the subject of continual improvement for many years but the group says the new third-generation catalysts, know as 51-3, represent a significant step forward in the technology.

Development, of the new 51-3 catalyst is the product of both ICI's experience in methanol plant design and operation as well as catalyst design and manufacture. The new catalyst has been tested and proven in ICI's own w
scale 1,500 tonnes a day methanol
at Billingham in north-east Engl

The Billingham tests have show
the new catalyst has increased acti
stability and strength. ICI says
improved activity gives greater fle
ity to produce methanol with impr
efficiency while the improved stab
enables the catalyst to be used fo
to 50 per cent longer. The high stre
ensures that the catalyst can withs
plant upsets and is easily discharg

The newcomer's high specifi
means that by-product formation is
lowest. This is mirrored in the low
consumption of natural gas and le
wastage of methanol during the dis
lation process. The catalyst consists
a number of uniquely formulated co
ponents and its active copper phase
supported on a zinc aluminate co
pound that gives the catalyst go
mechanical strength while allowi
reactant gases access to the acti
copper metal surface. Microcrystalli
zinc oxide is also present to protect t
copper metal surface site from contan
inants during operation.

ICI has also developed sophisticate
computer programmes that will enab
it to maximise the efficiency of the ca
alyst for each individual plant.

**-- P.T.I. Science Servic**
**July 16-31, 199**

## NATURAL RUBBER FROM GUAYULE

The Southeast Asians domination over natural rubber may soon be eclipsed, with Texas deserts producing a miracle plant that yields rubber. The new shrub — guayule — has also brought a new sign of economic boom for the Texans.

The all-but-forgotten shrub has been found to be a rich source of natural rubber. A Texas A&M biochemist has developed a method for tapping natural ber from these shrubs. But there are ne thorny problems — these shrubs w only in winter and the yields are te unpredictable. However, the bio-emist has come out with a solution. order to increase the yields by one-rds he has sprayed a chemical, chlo-henoxytriethylamine. He is hopefully aiting the results. And he is sure that s method can produce rubber for 40 nts a pound — roughly on par with utheast Asian rubber. This will also duce the US dependence on Southeast sian rubber and tigger off a boom for e not-so-rich Texans.

## IL RECOVERY IN CANADA

The Athabasca wilderness in the orthern Alberta of Canada has abun-ant natural tar reservoirs. But experts ave found them to be mines of gold. hey say these contain one trillion bar-els of oil, 4 times as much as in all of audi Arabia. But how to tap oil from his black, sticky mud, wondered Canadian oilmen.

Now, the founder of Solve-Ex Cor-oration in Albuquerque, New Mexico, ays he can solve the problem. In two years, he says, he can squeeze out 30,-00 barrles a day of oil from these muds. And other payoffs are — recoverable metals like gold, silver, titanium etc. which are two to three times more worth than the oil.

But the large-scale viability of the recovery process is yet to be established. The corporation founder has trucked about 1000 tons of the mud to a site 1,700 miles away and is engaged in perfecting the technique to tap the oil. He is confident that he can produce oil at $18 per barrel-$4 less than the world price of crude at present.

If all goes well, he wants to set up production facilities at Alberta by 1996. But the oil barons are not enthusiastic. They are confident about the technology, but say that there will be economic problems hampering the ambitious project.

## SILVER LINING FOR ORGANIC WASTES

The safe disposal of organic wastes is of great concern to the chemical process industry worldwide. Such wastes arise from many different sources and appear in a variety of forms, although usually as liquids or sludges.

Typical of these — and potentially the most troublesome as far as safe disposal is concerned — are the small amounts of phenol (carbolic acid) in liquid streams, pesticides, polychlorinated biphenyls (PCBs) and chlorinated and aromatic solvents. The main routes taken for the disposal of difficult organic wastes are landfill and incineration. However, incinerating organic industrial wastes, poses problems in that even more toxic materials can be formed if the combustion conditions in the incinerator are not carefully controlled.

This problem has been highlighted during the incineration of PCBs when formation of deadly dioxins has been detected in the off gases because of incorrect operation of the incinerator or poor control of the process conditions. Even municipal incinerators burning domestic refuse have been shown to discharge measurable quantities of the highly toxic compound known as 2, 3, 7, 8 tetrachlorodibenzo-p-dioxin.

A team of researchers at the United Kingdom Atomic Energy Authority's Dounreay research establishment in northern Scotland has for some time been developing a process, known as Silver-2, that involves electrochemical destruction of radioactive contaminated solvents arising from the reprocessing of spent nuclear fuel. It can also be applied to a wide variety of non-nuclear organic wastes in the chemical industry.

Silver-2, came about as a result of studies on the dissolution of spent nuclear fuel in nitric acid. The intractable plutonium oxide residues could be taken into acid solution for eventual recovery of the plutonium content. However, to do so called for the use of particularly aggressive acid mixtures-hence research into an electrochemical alternative.

As part of the research, a simple electrochemical cell was constructed in which a solution of silver nitrate and nitric acid was placed in the anode compartment and nitric acid in the cathode compartment.

The presence of an electric current in the operating cell demonstrated that the intractable plutonium oxide residues dissolved readily and rapidly. The Silver-2, plus ions generated at the anode terminal of the cell were able quickly to oxidise the solid plutonium oxide to form soluble plutonium dioxide-2-plus and, at the same time, reduce themselves to silver-1-plus ions.

This meant the silver-2-plus ions could then be re-oxidised at the anode electrode to form silver-1-plus ions, which could then further react with more insoluble material. It appears from the operation of the cell that the silver ions act as electron transfer agents between the electric power being applied to the cell and the insoluble plutonium oxide, without themselves being consumed.

This continuous use of the silver oxidant has permitted a practical process to be developed that requires the presence of only a relatively small amount of silver. The next logical step in the research followed an appreciation that the silver-2, would in all probability react with organic matter contaminated with plutonium — such as cellulose tissues used to mop up minor spillages in gloveboxes and highly active cells.

Trials were carried out in which plutonium-contaminated tissues were placed in the anode compartment of an operating electrochemical dissolution cell. There followed an immediate reaction, evidenced by the disappearance of the dark brown silver-1-plus ions to give the clear solution of silver-2-plus. This continued until all the tisues were consumed, whereupon the brown $AG^{2+}$ was again in evidence, the cellulose tissue having been completely oxidised to form carbon dioxide and water. It was then relatively simple to examine the possibility of destroying the radioactive-contaminated tributylphosphate in odourless kerosene (TBP/OK) solvent used at the reprocessing plant for the dissolution of spent nuclear fuel elements.

The initial stages of an experiment in which TBP/OK solvent had been added to the stirred compartment of an electrochemical cell were not encouraging. However, as the temperature of the cell gradually built up, because of the passage of electric current flowing through it, a reaction between the Silver-2, and the TBP/OK was seen to occur at a temperature of 55°C. The continued passage of current eventually resulted in the destruction of both the TBP and the Kerosene.

The destruction of the moderately reactive TBP was perhaps not too surprising but the facile reaction of the supposedly inert odourless kerosene was unexpected and an important bonus. Once it was discovered that Silver-2 could destroy even relatively unreactive organic species at temperatures hitherto assumed capable of destroying Silver-2, by parasitic reation with the water, the real potential for the destruction of both nuclear and non-nuclear organic wastes was immediately apparent.

The Dounreay Silver-2 process, if used to treat chemical organic waste streams, has the following attractive features:

* The destructive process operates at relatively low temperature, reducing the possibility of any maloperation causing volatisation and subsequent release to atmosphere of any untreated organic wastes.

* It operates at or below atmospheric pressure, which also reduces the chances of an inadvertent atmospheric discharge.

* It can be stopped within seconds of the power being switched off as there is only a small amount of organic waste in the system at any time, thereby limiting the amount of stored energy available for an excursion.

* The same cell-operating conditions may be used to dispose of a wide variety of organic wastes, a factor that removes most of the problems associated with poor characterisation, documentation and labelling.

* There appears to be no volatisation of the low molecular weight organic species undoubtedly formed as reaction intermediates during the process.

* The process operates at high electrochemical efficiency.

**(Courtesy: London Press Service).**

---

## A REVOLUTION IN REFRIGERATION

A new refrigeration technique using sound waves, developed by the U.S. navy for use in space, may bring a revolution in refrigeration on earth, save the ozone layer and pose a serious challenge to the multi-billion dollar chemical industry.

The new technology, called cyrocooler and developed by a team of navy scientists headed by Thomas Hofler, uses a 2-inch loudspeaker to produce sound waves that energises air trapped in a 20-inch long plastic tube to heat one end of the tube and chill the other.

A diagram of the cyrocooler published in the 'Washington Times recently shows that its mecha included a commercial loudspe driver, aluminium cone driving pi flexible gas seal, heat flow out, exchangers, cooling plate and an ac tic resonator.

An ultralight aluminium c attached to the voice coil of a comm cial loudspeaker drives the cyrocoo The model is about 20 inches lo Even though appliances using the n technique would be using sound wa to keep cool, they would not be noi said John Sanders, spokesman for naval postgraduate school in Monter California, where the new technolo has been developed. From the outsic everything would be silent.

Inside the engine, "it would sour like a Saturn-5 rocket being launched He said consumers should not wor about any accidental sonic booms in th house. "We know how to insula sound. There shouldn't be any pro blems" he said.

Hofler, who was honoured for hi work by the acoustical society of America, estimated that a 4-inch loudspeake could cool a standard refrigerator. A clear asset of the new technology is tha it does not use chlorofluorocarbons (CFC's), a key ingredient in contemporary refrigerants which are blamed for destroying the ozone layer.

The process has been patented and negotiations are under way with an unidentified manufacturer to develop the world's first acoustically driven refrigerator, Sanders said. However, commercial use of the new technology is not considered imminent.

Du Pont scientists said that they had not heard of the thermo-acoustic technology but news of such innovation was not unexpected. A spokesman for Du Pont said that 30 per cent of the current CFC market would go into non-CFC alternatives, "and this would probably fit in there".

# New Products

## PERFORMANCE BALL LVES

eninsular Techno-Enterprises offers conomic range "Series G-44" soft ed three piece sandwhich pattern valves. "Series G-44" promises n performance over a wide range of vice condition due to their efficient igns and superior quality of mater- employed in the manufacture.

The best design and construction provements have been incorporated h the field experience to provide ble tight operation and resist corros- n for many thousand cycles of ope- on in control of corrosive liquids and ses in process industry.

The body of the valve fits in between nnectors and contains the ball, PTFE dy connectors seals and stem sembly. The corrossion resistant ball held between the body seat rings hich are preloaded by tightening the dy connector bolting. This ensures ak tight shut off in both direction der pressure or vaccum conditions.

The seats are of low frictional PTFE hose self lubricating properties are rther improved by a special "SEAT P" design to retain seal and adjust for ear for many thousand cycles of ope- tion. The use of PTFE for all sealing embers results in a low torque valve nd "Series G-44" valves could be an eal choice for fitting with pneumatic ctuators at an economical cost.

The stem assembly incorporates an nti-blow out stem inserted from inside he body. The seal is effected by a set f belliville spring washer loading a TFE stem seal positioned between olders on the stem and the body, the tem engaged in a slot in the ball and o allows the ball to float under pres- sure. The result is leak tight shut off and absence of repacking problems. The balls are of stainless SS 316 polished as standard, with no attempt to reduce cost by chrome plating cheaper materials nor by use of AISI 410 (13% Chromium stainless steel). Pitting is bound to result in such inferior grade of materials leading to early seat damage and a leaky valve.

Size range includes 8 mm to 100 mm as standard in screwed socket weld and flanged end connections in materials of carbon steel, stainless steel SS 304 and SS 316, body configuration. "Series G-44" valves in stainless steel material are compatible for use with Acetic Acid, Alum, Amines, Ammonium Sulphate, Barium Hydroxide, Calcium Nitrate, Detergent, Glycol, Esters, Dyes, Intermediates, Molasses, Oxalic acid, Salicyclic acid, Oxygen, Demineralised water, liquor, Zinc nitrate and a host of other corrossive Fluids. "Series G-44" valves in carbon steel, body material finds application for compressed air, LPG, Fuel oil, HSD, other petroleum products, vaccum, LP steam, Alkalies, Aldehydes, process fluids, hot water etc.

For more details contact: M/s. Peninsular Techno Enterprises, 213, Linghi Chetty Street, Madras - 600 001. Tele No. 512289/513105, Telex No. 41-7509 MMS IN, Fax No. 044-513219.

## BUILDING SEALANT: MULTI-SEAL

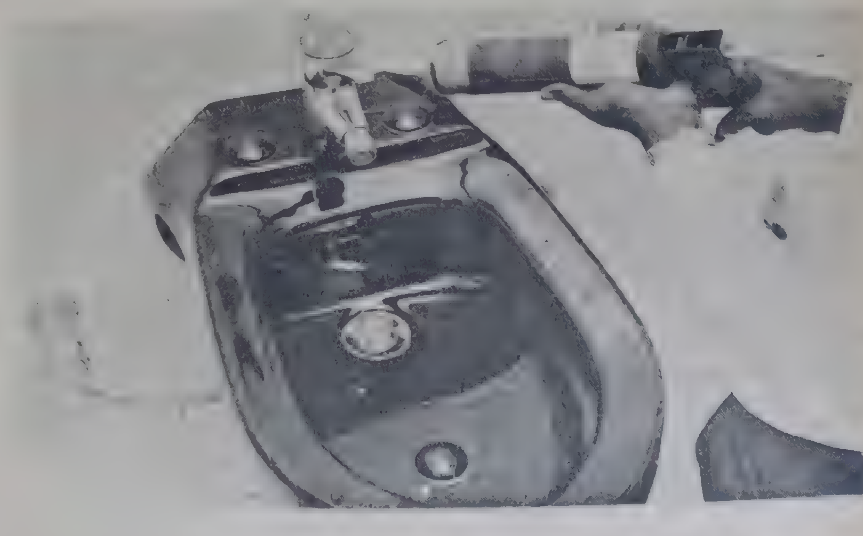
Anabond has introduced Multiseal, which is useful for construction applications. Multiseal is a one part Room Temperature Vulcanising silicone Sealant. It cures quickly at room temperature, producing durable, flexible, low modulus Silicone rubber Seal. The cured sealant has excellent elongation and compression recovery.

**Applications:**

1. Sealing gaps between door/window frames and wall.
2. Sealing gaps between wash basin and wall.
3. Sealing gaps between bath tub and wall.
4. Filling gaps in expansion joints.
5. Filling gaps between closet and wall/-floor.
6. Sealing glass-aluminium joints in doors & windows.

**Advantages:**

1. Single component, easy to use and no mixing involved.
2. Excellent elongation (400%) and compression.
3. Excellent weatherability.



Sealing gap between wall & fawcet with 'multiseal'

4. Availability in different colours.
5. Tested as per International Standards.

Multiseal is approved and used by architects and leading Hotels like Taj Mahal Hotel and East India Hotels, Bombay.

**Packing:** Multiseal is available in 310 ml cartridge. **Price:** The price of each cartridge is Rs. 140/- plus local taxes.

For further details: Please write to: Regional Manager-Marketing, Anabond Private Limited, 3-A, Adyar Bridge Road, Adyar, Madras - 600 020.

## UV-VIS SPECTROPHOTOMETER

ECIL's PC-based UV-VIS stable beam spectrophotometer, GS5702, is a versatile unit for both qualitative and quantitative analysis. It combines the advantages or single beam and double beam instruments. The recording of transmittance or absorbance is simple and fast.

A high resolution grating having 1200 grooves/mm is used. The grating is rotated by a stepper motor through a precise and antibacklash lead screw-nut pair for better accuracy and repeatability. Filters are automatically introduced in the beam path at specific wavelengths to minimise the effects of the stray light. The sample compartment accommodates four 10 mm path length cells simultaneously and are positioned automatically in the path of the light-beam.

A single photomultiplier tube (PMT) is used for the entire range. The EHT required for the PMT is automatically adjusted by the computer to maintain a constant level of output to ensure a flat baseline. Facility for kinetic studies with real time graphic display is provided.

GS5702 has varied applications ranging from research to routine jobs. Estimations of protein content of blood, nucleic acid molecules, detection of soil organic compounds, determination of enzyme activities on organic petroleum technology, colorimetric and forensic science are some of the fields which find extensive use of the GS5702 system. The PC and its accessories can also be used independently for any other application.

For further details contact: Electronics Corporation of India Ltd., Instruments Group (Marketing), ECIL, PO. Hyderabad-500 762.

## FERMENTATION PROCESS

Fermentation microbiology is a major feature of research at Kent Biological Laboratory (University of Kent, Canterbury, Kent CT2, 7NJ, England) where a wide variety of problems ranging from the development of new process technology for the treatment of hazardous environmental chemicals to the production of micro-organisms and their metabolites and enzymes for research and applications are being dealt with. Among these are projects related to health care (antibiotics and clinical enzymes), soil conservation (microbial inoculants), and the biotransformation of chemicals to value added products such as fragrances.

The fermentation facility enables micro-organisms and animal cells to be grown at any scale up to 150 litres. This new fermentation pilot plant, commissioned in 1989 and housed in purpose-built laboratories in the University's Research Development Centre, has been established by funds from the Science and Engineering Research Council (SERC), industry and the university. In addition to its use for specific research studies, it provides the means of producing quantities of diverse materials for subsequent investigation, and the opportunity for research staff to receive training in large-scale culture and downstream operations.

Current projects include those relating to detoxification of hazardous chlorinated chemicals (solvents, pesti
by bacteria and bacterial enzymes
the production of mucorrhizal f
inoculants for the establishmen
forest trees.

Fermentation research at Canter
is also heavily involved with pro
improvement. Scientists in the bio
ical laboratory have considerable ex
ience of continuous cultures, cell rec
reactors, and immobilized cell syste
Current work on these topics is ai
at enhancing the production of sec
dary metabolites (antibiotics) and
foreign proteins in cultured animal c

## DNA PROBES

Many organisms that cause dise
are difficult to detect. Standard tests
detect listeria, for example, a bacteri
that causes food poisoning, ta
between five and 12 days. To make m
ters worse, viruses and many organis
that are sexually transmitted do n
show up under standard microbiolog
cal tests.

By contrast, DNA probe tests pr
mise to provide sensitive and selecti
detection of bacteria and viruses i
hours. DNA probes are short DNA mo
ecules whose chemical structure allow
them to bind tightly to other targe
DNA's by the process of hybridization
Because hybridization is a well-know
chemical reaction, one whose result ca
be predicted readily, scientists ca
design a DNA probe which will be as
general or as specific as the test requires,
hybridizing to all bacteria, or a genus,
species or strain of organism.

PA Consulting Group, (Cambridge Laboratories, Melbourn, Roystone, Hertfordshire, England SG8, 6DF) is one of the leading companies playing a role in the development of DNA probes. The market for these is estimated to be worth at least 500 million dollars by 1992, in sales of tests to hospitals that need to diagnose difficult infectious diseases.

ork is on a project to automate a
A test — something that would
e it a simple "one-step" operation.
antages are that it makes sure that
n test is performed under ideal con-
ons, producing maximum sensitivity.
so overcomes the problem that very
nplicated tests are not feasible in
st clinical laboratories, staffed by
d-pressed technicians.

Compared to many application of
technology, DNA probes tests are
y to produce. A single run on an
omated synthesizer, makes milli-
ms of DNA enough for millions of
ts. The fragments of DNA, and the
er reagents, cannot replicate even
ide a bacterial cell, and so there are
ne of the regulatory fears that accom-
ny the release of genetically engine-
ed organisms into general use.

The Group's Technology Division
ovides a capability across a wide
ont, including biological science,
aterials and physical sciences,
echanical engineering, manufacturing,
ectro-technology and electronics,
omputing, process engineering and
esign.

The group has developed several
asy-to-use diagnostic tests for 'home
nd doctors' use. It has also developed
roducts and processes for ophthalmic,
harmaceutical, dental and other health-
care business, as well as for many other
ndustries.

## EVAPORATION SYSTEM

VG Engineers Private Ltd., Baroda, offers multiple-effect evaporation systems based on thermocompression and latest technology. The system also consists of special heat recovery systems, resulting in minimum energy consumption per tonne of water evaporated.

Salient features include forced circulation type external calendria system which makes the plant compact and increases life of the plant due to self-cleaning action by preventing scale formation. The system is tailor-made to suit available steam pressure in the factory and also the feed conditions and the extent of concentration required.

The completely computerised systems design can optimise process conditions and design of the plant to minimise energy consumption for various feed conditions and parameters. It can be offered in M.S./SS304/SS316 and other materials of construction.

It has truly continuous feed and withdrawal. It can incorporate sophisticated instrumentation and controls to make the plant automatic depending on individual requirements. It is ideally suited to chemical, pharmaceutical, dye intermediates, sugar concentration of sweet water for glycerine, etc. Pneumatic conveying systems, pressure leaf filters, etc. are also offered.

For further details write to Poly Quip, 3/922, Navjivan Society, Lamington Road, Bomaby-400 008.

## PROXIMITY SWITCH

Proximity switches can help one switch, count or control an operation with no physical contact between sensor and component. In general they find extensive appliactions in all types of industries where automatic control and some sort of position sensing are involved. Specific areas where they can be used are numerous.

They find appliations in machine tools, power system controls, traction systems, aerospace and in all machines such as those used in the manufacture of tyres, textiles, paper, steel, chemicals, fertilizers and food industries and so on.

These switches are available in a wide range in various voltages, curent, dia, etc.

For further information write to M.R.K. Engineers, 304, Paradise Apartments, Shantinagar, Road, No. 27, Wagle Estate, Bomaby-400 604.

## CARBON DIOXIDE MONITOR

The "infrared carbon dioxide monitor" measures $CO_2$ to ensure healthy, safe work places, greenhouses, and HVAC systems. Said to be the only non-dispersive model with no moving parts, it provides long-term maintenance-free operation. The compact monitor has a 1-minute warm up time and an infrared diffusion sampling cell that eliminates the need for pumps and filters. Calibrations or span gas checks are not needed. Agents are sought.

For further write to Valtronics, Dept. CN, 1011, Detroit Ave, Concord, California, 94518, USA.

## FILTER

The modular "Vitalizer II" can be customised for residential or small commercial use. Installed under the sink, it features filters, a carbon filter, and a reverse osmosis module to remove heavy metals, sediment, chemicals and other contaminants from 38-760 litres a day, depending on options, storage tank, ultravoilet light, and a deionisation module. Agents are sought.

For further details write to Trysan Research, Inc., Dept. CN, 1122 S. State St., 22, Provo, Utah, 84601, USA.

## PURIFIER

Ultraviolet (UV) water disinfectant system — industrial and domestic water purifier — uses teflon technology. The UV system provides a unique, cost-effective, simple solution to fluid quality problem. It is useful for industries like food processing, pharmaceuticals, breweries, disinfectants of secondary/-tertiary effluents, electronics, drinking water, laboratories, hospital, fish hatcheries, cooling towers, swimming pools and bottling plants.

It is Ultraviolet Technology's patented PTFE based system. Fluid flows through PTFE tubes with germicidal UV lamps placed outside the tubes. UV rays pass through teflon tube into the fluid body and disinfection occurs.

Advantages: eliminates need for chemicals and chlorination, 99.9 per cent micro organism kill possible, (bacteria, viruses, yeasts, algae, protozoa, nematode eggs, mould spores, fungi), non-wetting conveying tubes eliminate fouling and their consequent cleaning, complete separation of fluid and electrical circuits results in improved reliability and safety, practically no maintenance, extremely low operating costs, simple, safe and cheaper than any other disinfection method without affecting test and chemical composition of water. Capacity for industrial model ranges from 225 LPH to 1,50,000 LPH and capacity for domestic model 60 LPH and 120 LPH.

For further details contact: Ultraviolet Water Technology (Bombay) Pvt. Ltd., Second Floor, Delstar S. Patkar Marg, Bombay-400 036.

## LOW COST PROTECTION OFFERED BY PLASTIC STORAGE BIN

Haogen — a low cost plastic sheeting and steel net structure, developed and manufactured by Haogenplast in Israel, can protect large quantities of grain against the depredations of weather, rodents and other pests. Such units can be put up quickly almost anywhere; their erection does not require specially skilled labour or costly equipment.

Whether a country can provide adequate protection for the grain its farmers grow is a decisive factor in its ability to feed its population. However, storage facilities are likely to be expensive, and not every economy can afford to build enough of them.

Because of that, in many places much of the harvest must be left in the open, bagged or just in unprotected piles. The cost of doing so, however, is prohibitively high: it has been estimated that in the Soviet Union, for instance, up to 25 per cent of the harvest and of grain imports are lost, for lack of protection.

Haogenplast, veteran experts manufacture of plastic sheeting variety of applications, now o simple and affordable solution. Th provides PVC sheeting in a confi tion, which even inexperienced pe nel can quickly assemble into a st bin. This is placed on a concrete or even on a piece of well lev ground, and surrounded by a suppo net of welded steel rods.

The sealed PVC envelop not assures that the bin's contents remain dry; because it is relativel tight it also tends to prevent insect p from multiplying in the stored gr The effectiveness of this appro already has been proven by satis users, in areas as far apart as Venezu and Mozambique, South Africa Nepal.

With adequate care, such a "temp ary" storage unit can be used dur several successive seasons. However, cost — approximately $3 per ton stored grain — is low enough to be wr ten off in just one year.

-- **Innovati**

For Your Regular Requirements Of:

MANGANESE CHEMICALS

including

1. Manganese Sulphate Mono Hydrate Technical, Feed and Fertilizer Grades
2. Manganese Carbonate, Chloride. etc.

ZINC CHEMICALS

including Zinc Sulphate - Fertilizer and Feed Grades

Please Contact:

ANDAVAR CHEMICALS PVT. LTD.

26, 1st Cross Street, T.T.K. Road, Sreeram Nagar, Alwarpet, Madras 600 018.
Phone: 457280

# Indian Standards

(Continued from previous issue)

711:1970 Ferric chloride technical (first revision).

716:1987 Pentachlorophenol (second revision).

717:1969 Carbon disulphide, technical (first revision).

718:1977 Carbon tetrachloride (second revision) (Amendment No. 1 January 1987 and Amendment No. 2 Sep. 1988).

761:1988 Oil of ginger (first revision).

797:1982 Common salt for chemical industries (third revision) (Amendment No. 1).

798:1986 Ortho-phosphoric acid (second revision).

799:1985 Liquor, Ammonia (second revision) (Amendment No. 1).

826:1980 Ammonium sulphate, fertilizer grade (second revision).

869:1976 Ethylene dichloride (second revision) (with Amendment No. 1, February 1989).

873:1974 Liquid glucose (first revision) (with amendment No. 1).

874:1975 Dextrose monohydrate (second revision).

877:1977 Methods of sampling and test for activated carbons, powdered and granular (first revision).

S 879:1981 Sodium nitrite (first revision) (Amendment No. 1).

S 880:1956 Tartaric acid (with Amendment No. 1) (under revision).

S 881:1956 BHC, refined (withdrawn).

S 882:1984 Lindane (first revision).

S 885:1967 Common names for pesticides (first revision) (with amendment No, 1).

S 1000:1989 Lactose, commercial.

S 1013:1972 Triple superphosphate (first revision).

S 1040:1987 Calcium carbide, technical (third revision).

S 1050:1984 Lime sulphur solution (first revision).

S 1051:1980 Pyrethrum extracts (second revision) (with amendment No. 1 and 2).

S 1055:1984 Nicotine sulphate solution(first revision).

S 1065:1971 Bleaching powder, stable (second revision).

S 1078:1987 Copper naphthenate (second revision).

S 1089:1986 Oleum, technical (second revision).

S 1090:1093 Compressed hydrogen (second revision).

S 1091:1985 Nitrocellulose (third revision).

S 1109:1980 Borax (second revision).

S 1113:1965 Ammonium chloride, technical and pure (revised) (Amendment No. 2).

IS 1114:1964 Ammonium chloride, fertilizer grade (revised).

IS 1154:1957 Specification for temporary corrosion preventive, fluid, soft film, solvent deposited, water displacing (with Amendment No. 1 & 2).

IS 1188:1957 Ready mixed paint, brushing, oil gloss, genuine zinc oxide, for general purposes (Amendment No. 1).

IS 1235:1988 Acetic anhydride (first revision) (with Amendment No. 1).

IS 1251:1988 Zinc phosphide, technical (third revision).

IS 1306:1974 Aldrin, technical (first revision) (with amendment No. 1 and 2).

IS 1307:1988 Aldrin emulsifiable concentrates (third revision).

IS 1308:1984 Aldrin dusting powders (second revision).

IS 1309:1974 Endrin, technical (first revision).

IS 1311:1966 Ethylene dibromide (first revision) (with amendment No. 1 and 2).

IS 1312:1980 Methyl bromide (second revision).

IS 1314:1984 Calcium chloride (second revision).

IS 1334:1958 Calcium chloride, technical (withdrawn).

IS 1404:1970 Anti-corrosive paint, brushing for ships bottom and hulls, red or chocolate (second revision).

IS 1420:1972 Light basic magnesium carbonate (second revision).

IS 1421:1964 Specification for cellulose nitrate coated fabrics (revised) (withdrawn).

IS 1447:1966 Methods of sampling of petroleum and its products.

IS 1448: O Methods of test for petroleum and its products Leading pages to IS:1448.

P:1(1971) Methods of test for petroleum and its products Part 1 to Page 134) Neutralization number by potentiometric titration (first revision).

IS 1463:1983 Kaolin for cosmetic industry (third revision).

IS 1486:1978 Copper oxychloride, technical (second revision).

IS 1488:1985 2,4-D Sodium, salt technical (third revision).

IS 1505:1968 GAMMA - BHC (Lindane) smoke generators (first revision) (with amendment No. 1).

IS 1506:1977 Copper oxychloride dusting powder (second revision).

IS 1507:1977 Copper oxychloride water dispersible powder concentrates (second revision) (with amendment No. 1).

IS 1540(Part 1):1980 Quick lime and hydrated lime for chemical industries: Part I to Part II Quick lime (second revision) (Amendment No. 1).

IS 1636:1960 Chrome waxed sole leather (withdrawn).

IS 1665:1977 Cuprous oxide water dispersible powder concentrates (second revision).

IS 1669:1960 Cuprous oxide dusting powders (with amendment No. 1,2,3, 4 and 5).

IS 1674:1960 Specification for temporary corrosion preventive fluid, soft film, solvent deposited (with Amendment No. 1,2 & 3).

IS 1675:1971 Stearic acid, technical (with amendment No. 1 and 2).
IS 1676:1960 Oleic acid, technical (with amendment No. 1 and 2).
IS 1682:1973 Cuprous oxide, technical (fungicidal grade) (first revision).
IS 1683:1973 Barytes for rubber industry (first revision).
IS 1684:1973 Natural red oxide of iron for rubber industry (first revision).
IS 1685:1975 Whiting for rubber industry (first revision).
IS 1694:1974 Tartrazine, food grade (first revision) (with amendment No. 1, 2 and 3).
IS 1695:1974 Sunset yellow FCF, food grade (first revision) (with Amendment No. 1 and 2).
IS 1696:1974 Amaranth, food grade (first revision) (with Amendment No. 1 and 2).
IS 1697:1974 Erythrosine, food grade (first revision) (with Amendment No. 1 and 2).
IS 1698:1974 Indigo carmine, food grade (first revision) (with Amendment No. 1, 2 and 3).
IS 1699:1974 Methods of sampling and test for food colours (first revision) (with Amendment No. 1).
IS 1744:1970 Stannic chloride anhydrous, technical (first revision) (withdrawn).
IS 1745:1978 Specification for petroleum hydrocarbon solvents (second revision).
IS 1747:1972 Nitrogen (first revision).
IS 1767:1980 Dicalcium phosphate for dentifrice (second revision).
IS 1796:1986 Glycerine (second revision).
IS 1799:1981 Citral (first revision).
IS 1800:1981 Geraniol (second revision).
IS 1801:1988 Citronellol (second revision).
IS 1802:1975 Ionones (first revision).
IS 1824:1978 Insecticidal space spray (second revision) (with Amendment No. 1, 2, 3, 4 and 5).
IS 1827:1984 Dimethyl amine SL salts of 2, 4-D (second revision).
IS 1832:1978 Malathion, technical (first revision) (with Amendment No. 1 and 2).
IS 1833:1980 Diazinon technical (first revision).
IS 1839:1961 Toluene, reagent grade.
IS 1840:1961 Benzene reagent grade.
IS 1872:1961 Thinner for synthetic paints and varnishes for aircraft.
IS 1873:1961 Thinner, antichill for cellulose nitrate based, paints, dopes and lacquers for aircraft (Amendment No. 1, June 1980).
IS 1874:1962 Ready mixed paint, universal zinc chrome, priming (synthetic) for light alloys for aircraft (Amendment No. 1, December 1969).
IS 1880:1977 Zinc oxide and zinc salts for electroplating (first revision).
IS 1990:1982 Sodium hydrosulphite (first revision) (Amendment No. 1).
IS 2012:1984 Red phosphorus.
IS 2074:1979 Ready mixed paint, air drying, red oxide chrome, priming (first revision) (Amendment No. 4, 1989).
IS 2075:1979 Ready mixed paint, stoving, red-oxide- chrome priming (first revision).
IS 2080:1980 stabilized hydrogen peroxide (first revisi
IS 2088:1983 Methods for determination of arsenic (sec revision).
IS 2124:1974 Sodium bicarbonate (first revision).
IS 2126:1973 Phenyl mercury acetate, technical (first re sion).
IS 2127:1984 Stabilized methoxy ethyl mercury chlor (MEMC) concentrate (first revision).
IS 2128:1973 Parathion ethyl, technical (first revision).
IS 2142:1974 Bromide, technical (first revision).
IS 2211:1972 Sodium thiosulphate, anhydrous photograp grade (first revision).
IS 2214:1977 Silver nitrate pure and analytical reagent (fi revision).
IS 2249:1984 Adhesive (liquid) for leather beltings (first rev sion).
IS 2252:1988 Diacetone alcohol (second revision).
IS 2256:1972 Ammonium sulphate nitrate (withdrawn).
IS 2290:1962 Zinc sulphate for electroplating superseded b IS 1980.
IS 2307:1977 Magnesium powder for explosing and pyro technic compositions (first revision).
IS 2318:1980 Silver nitrate, photographic grade (second revi sion).
IS 2353:1963 Phenyl mercury chloride (BMC), technica (with Amendment No. 1).
IS 2354:1963 Ethyl mercury chloride technical (with Amendment No. 1).
IS 2358:1984 Formulation based on stabilized methoxy ethyl mercury chloride (MEMC) concentrate (first revision).
IS 2409:1985 Calcium ammonium nitrate (second revision).
IS 2432:1963 Liquid sulphur dioxide (Amendment No. 1).
IS 2449:1963 Silver dioxide.
IS 2488(Part I):1966 Methods of sampling and test for industrial effluents, Part I to Part V (Amendment No. 1).
IS 2490(Part 1):1981 General limits (second revision) (with Amendment No. 1) (Part 1 to Part 10).
IS 2508:1984 Low density polyethyl films (second revision)
IS 2519:1983 Calcium stearate for cosmetic industry (second revision).
IS 2520:1984 Zinc stearate for cosmetic industry (second revision).
IS 2520:1984 Magnesium stearate for cosmetic industry (secondry revision).
IS 2521:1984 Magnesium stearate for cosmetic industry (second revision).
IS 2543:1964 Cellulose acetate moulding & extrusion matrls.

2567:1978 Malathion Emulifiable Concentrates (second revision) (with Amendments No.1).
2568:1978 Malathion dusting powders (second revision) (with amendment No.1).
2569:1978 Malathion water dispersible powder concentrates (second revision) (with Amendment No.1, 2 & 3).
2570:1980 Methyl parathion, technical (first revision) (with Amendment No.1 & 2).
2682:1984 Chlordane emulsifiable concentrates (second revision) (with Amendment No.1).
2697:1976 Ammonium bicarbonate for food industry (first revision) (Amendment No.1).
2723:1985 Ammonium bromide, pure and analytical reagent (first revision).
S 2730:1977 Magnesium sulphite (epsom salt) (first revision).
S 2740:1986 Sulphanilic acid, technical (second revision).
S 2741:1973 Beta-Naphthol (first revision) (with Amendment No.1).
S 2744:1984 1-Naphthylamine.
S 2752:1978 Activated carbons granular (first revision).
S 2764:1980 Potassium sulphate, fertilizer grade (first revision) (with Amendment No.1).
S 2779:1980 Potassium chloride (muriate of potash), fertilizer grade (first revision).
S 2780:1964 Sodium bromide, pure.
S 2797:1982 Potassium bromide (first revision).
S 2798:1994 Methods of test for polyethylene containers.
S 2833:1973 Aniline, technical (first revision).
S 2850:1983 Zinc oxide for cosmetic industry (second revision).
S 2851:1983 Titanium oxide for cosmetic industry (second revision).
S 2861:1980 Diazinon emulsifiable concentrates (first revision) (with Amendment No.1).
S 2862:1984 Diazinon water dispersible powder concentrates (first revision) (with Amendments No.1).
IS 2863:1964 Chlorthon, technical.
IS 2864:1984 Chlorthon dusting powders (second revision).
IS 2865:1978 Methyl perothion emulsiable concentrates (first revision) (with Amendment No.1, 2, 3, 4 & 5).
IS 2881:1984 Barytes for chemical industry and oil-well drilling (second revision).
IS 2923:1974 Carmoisine food grades (first revision) (with Amendment No.1 & 2).
IS 2924:1974 Fast red E, food grade (first revision) (with Amendment No.1, 2 & 3).
IS 2931:1964 Ready mixed paints, brushing, aluminium-zinc oxide composite primer (withdrawn).
IS 2978:1986 By-products of lack (first revision).
IS 2979:1964 Fusel oil.
IS 3025 O Methods of sampling and test (physical and chemical) for water used in industry.
IS 3025 Part-1 (1987) Methods of sampling and test (physical and chemical) for water and waste water Part-1 Part-2 & Part-3 sampling (first revision).
IS 3026:1968 Tin salts for electroplating (first revision)
IS 3027:1964 Zinc cyanide for electroplating (superseded by IS 1880).
IS 3123:1980 Hydroxy citronellal (first revision).
IS 3124:1975 Terpineol (first revision).
IS 3134:1965 Menthol.
IS 3180:1984 Linalyl acetate (first revision).
IS 3204:1978 Limestone for chemical industry (first revision).
IS 3205:1984 Precipitated barium carbonate, technical (first revision) (Amendment No.1, August 1989).
IS 3229:1973 Naphthionic acid (sodium salt) (first revision) (with Amendment No. 1, Dec 82 and Amendment No. 2, Sep. 86).
IS 3241:1985 Geranyl acetate (first revision).
IS 3242:1965 Beta-oxynaphthoic acid (BON ACID) (under revision).
IS 3250:1982 Methyl ionone (first revision).
IS 3306:1974 Tolerance limits for industrial effluents discharged into public sewers (first revision) (withdrawn).
IS 3307:1977 Tolerance limits for industrial effluents discharged on land for irrigation purposes (first revision) (withdrawn).
IS 3221:1973 formaldehyde solution (first revision).
IS 3349:1965 Three-tined cultivator with seeding attachment, animal drawn (withdrawn).
IS 3383:1982 Wettable sulphur powder (second revision) (with Amendment No.1).
IS 3389:1965 Urea-formaldehyde moulding materials.
IS 3395:1984 Low density polyethylene materials for moulding and extrusion (first revision).
IS 3398:1965 Oil of patchouli.
IS 3399:1973 Zinc oxide for rubber industry (first revision).
IS 3400:0 Methods of test for vulcanized rubbers part 1 to part 22.
IS 3401:1979 Silica gel (second revision) (Amendment No.1).
IS 3470:1966 Specification of hexane, food grade (with Amendment No. 1).
IS 3493:1978 Methods of sampling and test for organic pigments for paints (first revision).
IS 3506:1967 Tables for alcoholometry (by pyknometer method) (first revision).
IS 3520:1979 Water-soluble sodium carboxymethyl cellulose (first revision) (Amendment No. 2, August 1987).
IS 3526:1981 Barium Chromate for paints (Amendment No. 1, January 1988) (first revision).
IS 3527:1972 Mica for paints (Amendment No. 1, November 1987) (first revision).
IS 3532:1987 Chemical cotton for nitrocellulose (second rivision).
IS 3536:1966 Ready mixed paints, brushing, wood primer, pink (Amendment No. 4, November 1988).

(To be continued)

# CHEMICAL PLANT DEVELOPMENTS

**JAMES LOCK**
**Consultant Editor, "*Processing*"**, London

## FLUIDIC PUMPS

The Fluidtec Pump, developed by AEA Technology for use in the nuclear industry, has been licensed to Alpa Technical Services, which will be in charge of its commercial exploitation. The pump's operation is based on power fluidic principles and represents a big step towards zero maintenance.

Power fluidics describes the use of fluid dynamic forces to drive process operations or to carry out simple tasks by hydraulic power. The technology is based on the application of a number of fluid flow phenomena such as entrainment, vortex flow and the coanda effect (wall attachment).

The fluidic pump was born of the need to develop a maintenance-free pump that could be used in nuclear plants, often behind massive nuclear shielding, and could operate for the life of the plant, generally more than 30 years.

Power fluidic pumps have been in operation at the United Kingdom Atomic Energy Research Establishment (AERE) plant at Dounreay in Scotland for more than six years. Confidence in their maintenance-free operation is such that more than 250 are being installed in critical areas of British Nuclear Fuels' Thermal Oxide Reprocessing Plant (THORP).

AEA has redesigned the pump to meet conventional standards and use conventional fabricaation techniques. Normally built of stainless steel, it can be manufactured from special materials and to any required standard. The advantages of power fluidic technology over conventional equipment include:

* No moving parts in contact with the process.
* No maintenance of wet end components.
* No glands or seals.
* Utmost availability and reliability.
* Safety in hazardous operations and environments.

Advantages in specialised process applications, besides reliability include:

* No glands to leak.
* Smooth internal contours that result in no solids build-up and are thus easily sterilised.
* Low shear characteristics, meaning a capability to pump delicate materials such as biological cultures, crystals and soft food products. This also enables highly erosive materials to be pumped without damage to the pump internals.
* No cavitation damage.
* No electrical connections and therefore durability in submerged operations.
* Pump liquors at temperatures close to their boiling points.

The Fluidtec Pump works similarly to a conventional single acting piston pump, but uses compressed gas or air. In a piston pump a pair of non-return valves is positioned around a cylinder/-piston arrangement. A flow is produced by the action of the piston as it travels in and out of the cylinder.

In the fluidic pump, the non-return valves are replaced by their fluidic equivalents and the piston is replaced by gas pressure acting on the liquid. By alternate pressurising and depressurising of the gas in the cylinder a flow is produced. The fluidic non-return valves operate by producing different regimes of fluid flow depending on directioon through the device. Two types of pump are available, using respectively the vortex diode and reverse flow diverter (RFD).

### Net Forward Flow

The simpler of the two types is RFD pump. This comprises gas cont ler, charge vessel, the RFD and the charge pipework, and operates repeatedly supplying compressed ai the charge in two phases, drive a refill. In the former, compressed ai passed through the controller to charge vessel, forcing liquid through RFD where more liquid is sucked fr the supply tank, and on to delive through the discharge pipe.

In the refill phase, liquid passes fro the supply tank through the RFD refill the charge vessel, with a part vacuum applied, when required, to t vessel via the controller to augment t filling rate. Repetition of these phas produces a cyclic pumping action. Th result is a net forward flow.

The diode pump incorporates tw fluidic diodes which act as non-retur valves. Again, by repeatedly supplyin compressed air to the charge vessel, cyclic pumping action is produce Three standard ranges of Fluidtec Pum are available: 10 to 30 litres/min, 50 t 100 litres/min and 150 to 250 litres/min, all with delivery heads up to 50 kPa. The services required are a conventional single phase electricity supply a compressed gas supply and a vent t collect the expelled air.

For further details contact: Alph Technical Services Ltd., Altec House Aintree Road, Greenford, Middlesex United Kingdom, UB6 7PL. Tel: +44 81 991 2626.

---

## CONVERSION TO ENVIRONMENTALLY FRIENDLY TECHNOLOGY

ICI has built a new 75,000 tonnes per year potassium hydroxide (KOH) plant

s Castner-Kellner site in Runcorn,
hwest England. The plant uses
-of-the-art FM21-SP electrolysers,
plied by ICI Electrochemical Tech-
ogy. ICI's Chlor-chemicals has
aced the old plant, which used tra-
onal mercury technology, with the
ipany's own leading edge electro-
mical technology running on the
re energy efficient FM21-SP elec-
ysers, using membrane technology.

The plant is designed ultimaately to
oduce 75,000 tonnes of 50% KOH
l 24,000 of chlorine a year. It has 30
I21-SP electrolysers arranged in two
vs of 15. They use Du Pont's Nafion
) membrane and can quickly and reli-
ly manufacture different grades of
OH to meet customer needs. This is
e first plant anywhere to make KOH
ing the FM21 electrolyser, and it
monstrates the feasibility of
ercury-free technology worldwide on
commercial scale.

KOH production starts with solid
otassium chloride being fed in. This is
ssolved and the solution purified and
ocked, ready for passing to the cell-
oom. The FM21 cells produce hydro-
en, chlorine and KOH solution by elec-
olytic action, and the chlorine and
ydrogen are piped away separately for
eatment. The KOH is fed to an evap-
ration plant for further concentration,
nd the solution transferred to storage.
pent potassium chloride solution is
ecycled.

**Energy savings**

The plant has the most up-to-date safety and control equipment, as well as sensors at every step of production which feed data to an automatic shutdown system. Switchgear permits a single electrolyser to be shunted out for maintenance or repair without affecting production from the other analysers, so enabling production to continue onstream. ICI says FM21-SP technology makes energy savings of up to 7% on previous designs and is one of the most efficient chloralkali production technologies on the market, while assembly and maintenance take far less time than with competitive cells.

ICI is not only one of the largest chloralkali producers in the world with an annual capacity of about 1 million tonnes of chlorine, it is also an important supplier of chlorine production technology. Globally more than 25 chloralkali facilities have selected FM21 electrolysers and ICI has carried out several new FM21 plant start-ups in other countries such as Colombia and the United States. ICI Chlor-Chemicals has received the 1990 Queen's Award for Technological Achievement for its FM21 membrane electrolyser.

For further details contact: Electrochemical Technology Business, HQ Annexe, Chlor-Chemicals Business, ICI C & P Ltd., PO Box 14, The Heath, Runcorn, Cheshire, United Kingdom, WA7 4QG.

## NEW TECHNOLOGY INSERTABLE FOR DUST CONTROL

DCE Group has launched its Sintamatic Insertable (SI) dust control filter, following the introduction in 1988 of the Sintamatic filter system, the first major change in fultration technology for some 30 years. Insertable filters are put directly into storage vessels, conveying systems and process machinery. A new Sintamatic element manufacturing plant has been commissioned at a cost of more than £1.4 million. The Sintamatic filter incorporates a polytetrafluoroethene (PTFE) coating on a high grade porous composite. Its rigid, self-supporting and compact elements offer three times more surface area than conventional fabric filters, and have a proven resistance to most chemicals.

The SI range includes some 14 filters with filtration areas from 4 m$^2$ to 70 m$^2$, providing the maximum capability in the smallest possible area. It offers cost-effective solutions to the problems of dust control in silos and storage vessels where filters must have a guaranteed long life and proven reliability. In mechanical conveying systems the SI controls the dust cloud created by product unloading, transfer or discharge. Typical applications are silos, mixers, blenders, mills and crushers, as well as ventilation of powder spray booths, automatic bag slitting machines and a wide variety of similar equipment.

**Extreme temperature version**

The SI uses a reverse jet air blast to clean the filter. The air forces its way through the material and cleans by aerating the surface. The usual jet pressure is 620 kPa, with a frequency of every three to four minutes. An extreme temperature version is being researched, but at present the upper limit is 65°C. This, however, covers 85% of the present DCE market.

The group is an acknowledged leader in industrial process dust control, and received the first Department of the Environment grant for a research project into environmental protection in 1984, shared with Loughborough University in the English midlands. In 1989 it received the Prix de Promotion Internationale for defence of the environment.

For further details contact: DCE Group Ltd., Humberstone Lane, Thurmaston, Leicester, United Kingdom, LE4 8HP.

## NEW METHOD FOR DISINFECTING WATER SAFER THAN CHLORINATION

A novel solar energy-based method of disinfecting water is being developed jointly at the Weizmann Institute of Science and the Volcani Centre. The water to be disinfected is exposed to sunlight and treated with a dye, methylene blue. The dye absorbs the light energy, transferring it to the oxygen dissolved in the water. The resulting high-energy oxygen is a powerful oxidant, killing microorganisms in the w
without forming dangerous by-prod

FOR YOUR REQUIREMENTS OF

**SODIUM CARBOXY METHYL CELLULOSE (C.M.C.**

**CELLPRO** -- HVB, LVB, MVB, DVB, LSW II, LSH

**CEPOL** -- HV, MV, LV, UV, UUV, DV, DV (SPL), HVP, MVP, LVP, UVP, DVP, DVP (SPL).

**SODIUM ALGINATE** -- MV, MVR, MVR (SPL)

For Soap, Textile, Pharma, Paint & Detergent

**CELLULOSE POWDER** -- CP 100, CP-X

CP-60

MONOCHLORO ACETIC ACID (MCA)

MCCP (SPL)

AGAR AGAR (CHINA GRASS)

METHYL CHLORO ACETATE (MCA)

ETHYL CHLORO ACETATE (ECA)

ISO PROPYL CHLORO ACETATE (IPCA

Manufactured by:

**CELLULOSE PRODUCTS OF INDIA LTD.**

Also Available: **MCCP** of M/s. OM NEELKANTH CHEMICALS (I) PVT. LTD.

Please Contact:

**R.K. CHEMICALS**

308, Samuel Street, Vadgadi, Bombay 400 003
Tel.: 339208; Resi.: 6051686, 6210271, 6212655

FOR QUALITY PRODUCTS AND COMPETITIVE RATES

DI BUTYL PHTHALATE (D.B.P.)

DI OCTYL PHTHALATE (D.O.P.)

DI OCTYL SEBACATE (D.O.S.)

DI BUTYL SEBACATE (D.B.S.)

BUTYL STEARATE

DI OCTYL MALEATE (D.O.M.

DI BUTYL MALEATE (D.B.M.)

DI OCTYL ADIPATE (D.O.A.)

DI BUTYL ADIPATE (D.B.A.)

OCTYL ACETATE

OCTYL STEARATE

CONTACT MANUFACTURERS

**Enbichem Industries**

219/224, Madhani Estate, 542, S.B. Marg, P.B. No. 7039
Dadar, Bombay - 400 028.
**Phone: 4225392 / 4228968**

AVAILABLE REGULARLY

H.P.M.C. E15/50 CPS/100 CPS

P.V.P. K 30

LACTOSE NZ/D.M.V.

AEROSIL - 200

PROPYLENE GLYCOL (DOW)

METHYLENE CHLORIDE

ANALGIN I.P.

LIDOCAINE I.P.

PHENYL BUTAZONE I.P.

METHYL ESTER

SODIUM STARCH GLYCOLATE - USP

I.P.A.

N.B.A.

M.I.B.K.

& OTHER SOLVENTS

Contact:

**ANAND PHARMA**

B/5, Capital Commercial Centre, Ashram Road,
AHMEDABAD 380 009.
**Phone: Office: 78024 * Resi: 413939**

TENTION

**SCANOMAX INDIA LIMITED**

OFFERS

**BULK DRUGS & DRUG FORMULATIONS**

**AT REASONABLE PRICES**

- * 6 APA
- * AMPICILLIN TRIHYDRATE I.P./B.P.
- * ATENOLOL B.P.
- * AMOXYCILLIN TRIHYDRATE I.P/B.P.
- * CEPHALEXIN I.P.
- * CLONIDINE I.P.
- * MEBENDAZOLE I.P.
- * GLIBENCLAMIDE I.P.
- * PIROXICAM I.P.
- * NIFEDEPINE I.P.
- * IBUPROFEN I.P/B.P.
- * CLOXACILLIN SODIUM I.P.
- * FURSEMIDE I.P.
- * CHLORAMPHENICOL I.P.

CONTACT

**SCANOMAX INDIA LIMITED**

**Admn. Office.**
2504, Sector 35-C
**CHANDIGARH.**
Phone :-- 43058
Telex : 395 237 PIDC IN

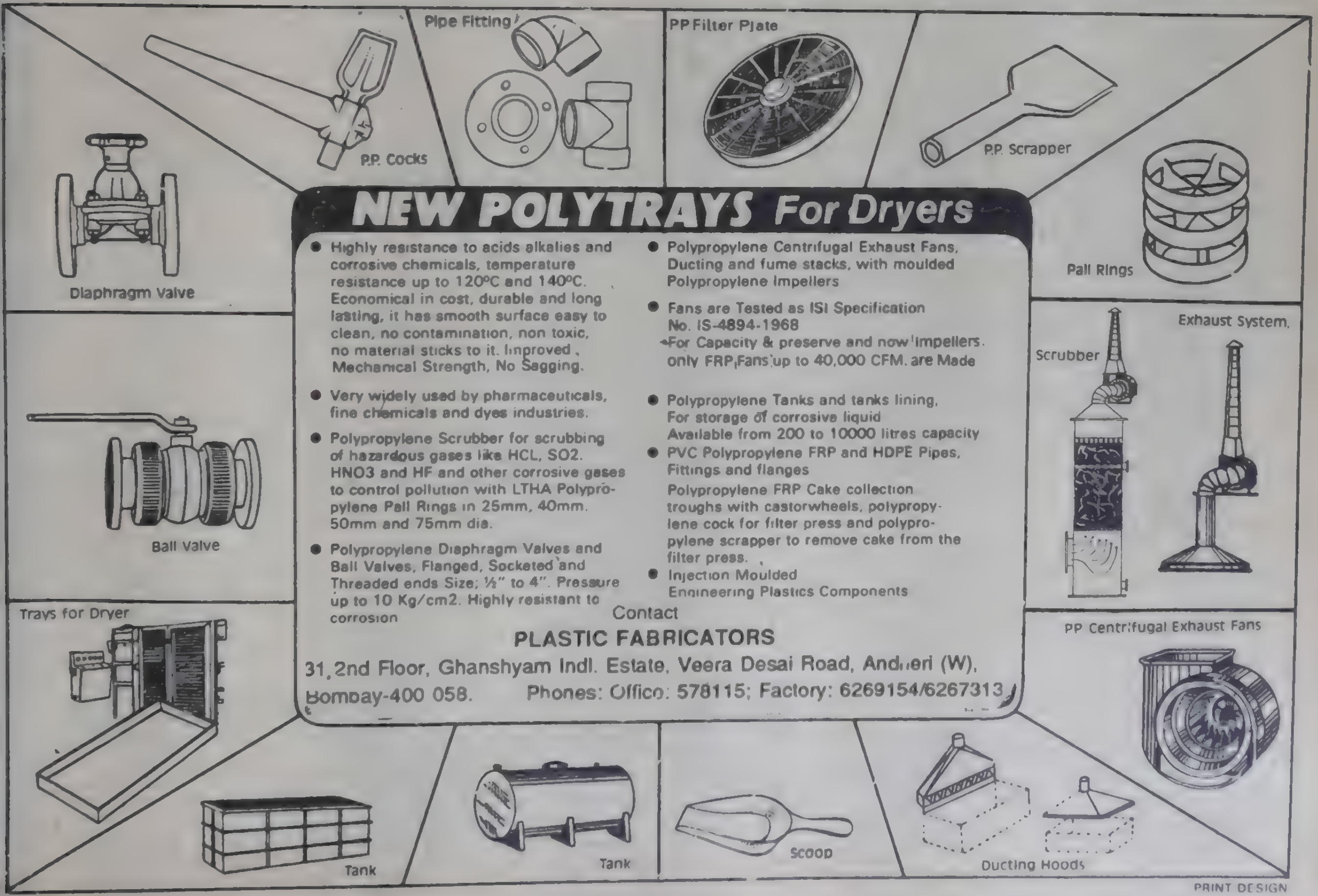
**Works.**
Vill. Channo,
23 KM Stone on
Patiala Sangrur
Highway, Distt.
**SANGRUR.** (PB.)

**BRANCH OFFICES**

Flat No: 916, 9th Floor
Arunachal Building
Barakhambha Road
**NEW DELHI**

184, Poonamallee High Road,
Post Box No. 1006,
**MADRAS-600 010**

4-B, Little Russell Street
**CALCUTTA-700 071**



**NEW POLYTRAYS For Dryers**

- Highly resistance to acids alkalies and corrosive chemicals, temperature resistance up to 120ºC and 140ºC. Economical in cost, durable and long lasting, it has smooth surface easy to clean, no contamination, non toxic, no material sticks to it. Improved, Mechanical Strength, No Sagging.
- Very widely used by pharmaceuticals, fine chemicals and dyes industries.
- Polypropylene Scrubber for scrubbing of hazardous gases like HCL, SO2. HNO3 and HF and other corrosive gases to control pollution with LTHA Polypropylene Pall Rings in 25mm, 40mm, 50mm and 75mm dia.
- Polypropylene Diaphragm Valves and Ball Valves, Flanged, Socketed and Threaded ends Size; ½" to 4". Pressure up to 10 Kg/cm2. Highly resistant to corrosion
- Polypropylene Centrifugal Exhaust Fans, Ducting and fume stacks, with moulded Polypropylene Impellers
- Fans are Tested as ISI Specification No. IS-4894-1968
  For Capacity & preserve and now impellers only FRP Fans up to 40,000 CFM. are Made
- Polypropylene Tanks and tanks lining, For storage of corrosive liquid Available from 200 to 10000 litres capacity
- PVC Polypropylene FRP and HDPE Pipes, Fittings and flanges
  Polypropylene FRP Cake collection troughs with castorwheels, polypropylene cock for filter press and polypropylene scrapper to remove cake from the filter press.
- Injection Moulded Engineering Plastics Components

Contact

PLASTIC FABRICATORS

31, 2nd Floor, Ghanshyam Indl. Estate, Veera Desai Road, Andheri (W), Bombay-400 058. Phones: Office: 578115; Factory: 6269154/6267313

**Available from Ready Stock at Competitive Rates**

ISOPROPYL BROMIDE
ISOPROPYL ALCOHOL
ISOBUTANOL
LIQUOR AMMONIA 910-888
METHYL ETHYL KETONE
METHYL ISOBUTYL KETONE
METHANOL R.C.F.
METHYL DICHLOROACETATE
MONOETHANOLAMINE
METHYLENE DICHLORIDE
NITROBENZENE
N-PROPANOL
OLEIC ACID PURE/TECH.
ORTHO DICHLOROBENZENE
PERCHLORO ETHYLENE
PHENOL CRYSTAL/LIQUID
PYRIDINE PURE
PINE OIL COMM.
PEG 200/400
SORBITOL
SOYALECITHIN
1-1-1 TRICHLOROETHANE
TRICHLORO ETHYLENE
TOLUENE
XYLENE
TRIETHYLAMINE
TETRACHLOROETHANE
TRIETHANOLAMINE
TRICHLOROETHYLENE
(SUBSTITUTE)

Please Contact:

**MAKS CHEM INDUSTRIES**

89, Princess Street, Pirbhoy Mansion, 2nd Floor, Bombay 400 002.
**Phones: Office:** 312358/257898/254363 **Resi.:** 8115229/8227223/6126969 **Gram: "MAKSOL"**

**WE BUY CHEMICAL WASTE & DISTILLED SOLVENTS REGULARLY. WE REQUIRE CRUDE SOLVENTS LIKE IPA * CHLOROFORM * C.T.C. * TEA * METHANOL * ACETONE * PHENOL**

**Factory:** Plot No. 1322, G.I.D.C., Opp. Hitech Capsule Factory, Sarigam, Dist. Valsad (Gujarat).

---

**SOYA LECITHIN**
**CITRIC ACID**
**MONO SODIUM GLUTAMATE**
**PECTIN**
**COCOA POWDER**
**BHA**

Contact

**SESU TRADING CORPORATION**

4th Floor, Sai Chambers, 367/369, Narsi Natha Street, Bombay 400 009.
**Phone:** 320832/326402
**Telex:** 11-76387
**Cable:** TRASESU

---

**OCTOATE * NAPHTHENATE DRIERS**
**LIQUID PVC STABILIZERS**

**More than 15 years of production and supply experience to customers satisfaction all over Inida R & D Department always available to supply products tailor-made for the customer. Prompt delivery as per customers schedule.**

Please Contact

aryavart

**ALSO AT**

TRICHUR : Vimla Bldg., Rice Bazar. Ph. 25878
NAGPUR : Panchsheel Textile Traders, Ph. 32667
DELHI : A.K. DUTT & CO. Ph. 738051
CALCUTTA : S. Mitra, Ph. 377028

**Aryavart Chemicals Pvt. Ltd.**

Post Box No. 33,
317 & 319 Arenja Corner, Plot No. 71,
Sector No. 17, D.B.C. Vashi,
New Bombay 400 705.
Tel.: (0215) 670384/671410
Gram: CHEMSFIELD, Vashi, New Bombay 400 703.

# Technological Scene Abroad

## SF JOINS SHELL/GEP JV IN E/EPS FOAM MARKET

ASF has confirmed that it is intro- ing an expandable PPE/PS engine- ng foam later this year, with duction based in Ludwigshafen. ell Nederland Chemie and General ctric Plastics announced a joint ven- e to produce and market such a pro- ct under the tradename Caril.

In the Shell/GEP venture, Shell is to ike and sell the material, while GEP ll supply a special grade of its mod- ed polyphenylene oxide and support ell with market development. BASF s in-house production of both PS and PE. Both companies reckon the cost the material will be around twice that conventional EPS.

BASF says the new offering will ombine the processing advantages of s Styropor EPS technology with the creased heat distortion resistance pro- uced by blending PS with poly 2,6-dimethyl-1,4-phenylene) ether PPE). This opens up applications for he foam in the automotive sector and n products coming into contact with hot ater.

BASF says applications may be found in car door panels, insulating components and covers; in insulating material for pipelines and jacketing for hot water tanks; sterlizable containers, and insulation for heating and air conditioning equipment. Depending on PPE content, a 20°C rise in HDT can be achieved.

The expandable beads are produced by post-impregnating extruded minigranules with a petroleum fraction blowing agent. Subsequent pre-foaming and complete foaming are carried out in the same way as for standard EPS (Shell/GEP's Caril uses pentane as a blowing agent). The product is still under development, says BASF, adding that work is underway to develop a flame-resistant grade.

Shell/GEP gave more details of its Caril offering recently. According to Shell's Michiel Jaski, product manager styrene/EPS, the new material will be targeted initially on the packaging area, where its higher heat performance and better rigidity enable it to be used in areas where EPS currently falls short in these properties. By varying the proportion of PPO from 5-30 per cent, foams with heat resistance between 110 and 130°C can be produced, compared with EPS's 100°C operating limit.

Other opportunities will be followed up in the automotive industry, and later in the building and furnishing industries, said Jaski. The higher heat performance offers the potential for applying heat-treatable coatings and laminates to the foam, as well as using it as the core of automobile rear spoilers, for instance. In the packaging area, the increased heat resistance will allow containers to be cleaned, by steam if required, and used in microwave ovens. Drinking cups are a prime application.

Caril's high strength-to-weight ratio compared with EPS foam will also enable thinner walled mouldings to be produced, down to 1mm. Five grades are being commercialized initially, with three capable of being processed on existing EPS machinery. Mark Wall, product manager PPO advanced programmes at GEP, adds that the use of PPO in the blend (both polymers are fully miscible) also helps dimensional stability, due to low moisture absorption. Shell/GEP is also developing an FR grade, which could be available in a few months.

## POTENTIAL FOR EXOTHERMIC PAINT

Representatives from Japanese com-

**MCA**
MONOCHLORO ACETIC ACID
**EDTA**
ETHYLENE DIAMINE TETRA ACETIC ACID
**NTA**
NITRILO TRI ACETIC ACID
**DTPA**
DIETHYLENE TRIAMINE PENTA ACETIC ACID
And Special Auxiliaries and Chemicals.

CHELATING AGENTS
AND THEIR SALTS

MFRS : SHIVCHEM INDUSTRIES
C-1-B, SHED NO. 1307/10, PHASE IV, G.I.D.C. ESTATE.
NARODA, AHMEDABAD-382330. TEL. NO. 812447
OFFICE NIRAV COMPLEX, 1ST FLOOR, NR NAVRANG SCHOOL.
AHMEDABAD-380014. T. NO. 495501, 491488

AGENT FOR MAHARASHTRA STATE
SHREE AMRUTA ORGANICS PVT. LTD.
813, RAHEJA CENTRE, 214, NARIMAN POINT,
BOMBAY-400 021 PHONE 240415, 243979, 2873680

pany Rustol Chemicals were in London to begin negotiations on technology transfer agreements for an exothermic paint it has developed and is starting to commercialize. The company is also establishing a London office, Rustol Technology Resources, to be responsible for technical agreements and joint venture projects in Europe. The company is saying little about the composition of the paint, which has not been patented, except that it is an organic material and that the heating is not based on resistance or chemical effects. However, Rustol is making great claims for the coating called MRX-001. It can produce and sustain temperatures from 1°C to 1000°C with low levels of energy consumption. A 6V potential is needed to produce 30°C temperatures, while 100V will give 800°C. And because it is a viscous fluid, it can be applied by brush or spray to any shape or complex surface.

Uses are claimed to be widespread, from space heating to de-icing of runways, from process pipe heating to cooking, and even textiles. In Japan, Rustol has carried out trials with an underfloor heating system for a car park.

Over a four-month winter period in Hokkaido, says the company, a conventional snow melt system covering 1000$m_2$ cost \$24,360 to run, whereas the MRX-001 heating area cost only \$7,400. Heat output was 76W/$m_2$ in the MRX-001 area. The company has identified over 200 potential applications and wants to set up joint ventures with companies to exploit the technology in each of them separately, tailoring the coating to the particular use. Rustol will continue to make and supply the chemicals involved.

## NOW YOU SEE IT, NOW YOU DON'T

Photosensitive chemicals that can be
repeatedly cycled from colour
coloured by irradiation with li
being commercialized by the UK
pany Traqmark Systems. The m
have been developed in collab
with Professor Harry Heller
department of chemistry, Univer
Wales, Cardiff, and have wo
year's Finniston Award for new
ducts based on a recent sci
advance.

The chemicals change from co
less to coloured when exposed to
of a particular wavelength, and c
made colourless again by irradi
with light of a different wavele
Yellow, green blue, purple and
shades are possible.

Paui Hudson of Traqmark se
range of uses for the company's o
ings, but says the nearest to realiza
is in security marking inks to foil c
terfeiters. Traqmark has develope
way of incorporating the photosensi
materials into microscopic poly
beads that are then used as a pigm
The resulting inks can be applied c
ventionally. Besides bank notes
credit cards, Hudson believes there
opportunities for use with products s
as pharmaceuticals and perfumes, vi
tapes and compact discs.

Hudson believes the materials a
have "a very real potential for provi
ing the basis for an erasable comp
disc that could be compatible with exi
ing playback systems". The materi
behave as "light switches", so they al
have the potential to be used as tran
istors in very high-speed optical com
puters, and in routing light signals fro
optical fibres. As a thin film, the mate
ials are being developed as the basis fo
a new type of monochromatic imagin
system.

Traqmark is now looking to link with
a larger chemical company to develop
the products' potential. Hudson says
Traqmark will also consider licensing
the technology.

(KNS-ADI)

FOR YOUR EXPORT/LOCAL REQUIREMENTS OF

REACTIVE BLUE 5RH
REACTIVE PURPLE H3R
REACTIVE GOLDEN YELLOW HR
REACTIVE BLACK HN
REACTIVE RED BROWN H4R
REACTIVE VS VIOLET 5R 100%, 140%, 180%
REACTIVE VS RED 5B 100%, 140%, 180%

JAGSON INDUSTRIES
264/1 GIDC, PHASE II
VATWA, AHMEDABAD 382445
PHONE : FACT : 832873, OFFICE : 352713,
RESI : 332349

# Biotechnology

## ONT OUTLINES GENE ERT BREAKTHROUGH

ientists at Du Pont and Duke Uni-
ty, North Carolina, have demon-
ed a method of inserting genes
tly into DNA of specific animal
by achieving genetic transforma-
on the skin and liver cells of live
. The development offers the poten-
o treat genetic disorders.

ne results were reported at the
ue Culture Association meeting in
ston earlier in June 1990. The
arch teams employed a particle
very system, Biolystic, developed
Du Pont, to insert genes encoding the
ein luciferase into DNA of selected
es. The animals' biosynthetic sys-
s produced this protein, which does
naturally occur in mice.

uciferase is an enzyme that occurs
ireflies and causes them to glow at
nt. This property allowed the
earchers to verify their work easily.
ditionally, to create a transgenic
mal, cells are removed and trans-
ted with foreign DNA, cultured and
ntroduced into the animal. Geneti-
ly modified retroviruses are usually
ployed for transfection because they
roduce their DNA into that of the cell.

However, using Biolystic, only the
NA of interest is inserted into intact
ls and not that of the retrovirus. In
dition, it is specific to target cells and
rried out in situ. The technique
ploys gold ''microcarriers'', 1.1
cron diameter particles coated with
e genetic material, to insert the DNA
o the cell. These are accelerated on
larger macrocarrier in a stream of
lium gas. The macrocarrier is stopped
fore it enters the animal tissue, firing
e microcarriers into the cell. Genetic
aterial can be inserted into the ears,
ighs or, via surgery, into the livers of
ice. Dr. Stephen Johnson, who leads
e Duke University team, believes the next step is to insert a therapeutically useful gene into animal liver cells.

## IFN/CISPLATIN SYNERGY TRIALS

Clinical trials of interferon in combination with the anticancer drug cisplatin are being carried out to determine if a synergy exists for treating lung and ovarian cancers.

The research, being conducted at the Western General Hospital in Edinburgh, UK, by the Imperial Cancer Research Fund, could prompt further uses for interferon.

The trial compares the efficacy of alpha-interferon and cisplatin treatment to that of cisplatin used alone. It also aims to determine an optimum schedule for drug administration.

Cisplatin is one of the most commonly used anticancer drugs. It is an effective cytotoxic agent for rapidly proliferating cancer cells. Scientists first observed a possible synergistic effect of its use with interferon about five years ago. Now, the ICRF's scientists aim to scientifically assess that benefit in a randomized trial.

While interferons have proved effective in treating cancers such as hairy cell leukaemia, patients taking the drug suffer ''flu-like'' symptoms. Fatigue, drowsiness and impairment of cerebral function are the most common and the trial will also monitor psychological well-being of patients.

These side-effects are dose-dependent and reversible, but their severity will determine if there is a real therapeutic benefit in using the combination.

The trial is assessing the drug combination in two types of cancer. Non-small cell lung cancer, which represents three-quarters of all lung cancers (the most common type of cancer ) and ovarian cancer.

## ICI BACKS ''TROUBLED'' CORWIN

ICI has said it remains firmly committed to the development of its drug Corwin for the treatment of mild heart failure, despite critical reports in the media. Links have been drawn in recent articles between a decision to withdraw a US product licence application and problems that have occurred in the UK as a result of misprescription. ICI says Corwin's PLA was withdrawn, ''without prejudice to further reapplication'' because of insufficient data to meet FDA requirements on efficacy.

Corwin (xamoterol), a partial agonist of beta-1 receptors, provides a stabilizing effect on heart beat in mild to moderate heart failure. Serious side-effects were reported last year, when the drug was misprescribed to patients suffering from severe heart failure. These included worsening of the condition, dizziness and aggravation of diseases causing obstruction of air passages.

In April, xamoterol was contraindicated in moderate heart failure to create a ''safety buffer zone'' and remove an area of doubt for the physician.

An exercise test is required to meet the precise definitions of when the drug can be applied, claims ICI.

## FIRST AIDS VACCINE PATENT APPROVED

Viral tecnnologies says it has received approval on the first US patents for a potential HIV subunit vaccine component. The company, a subsidiary of US biotech companies Cel-Sci and Alpha 1 Biomedicals, should receive the final patents covering exclusive production, use and sale of HGP-30, the active component of a potential Aids subunit vaccine, in the next few months.

# News about New Projects

## NORSK HYDRO STUDIES PVC AT RAFNES; UK PLANS DOUBTFUL

Norsk Hydro is to carry out a full design study for construction of a new 100,000 ton/year suspension-grade PVC plant at Rafnes, Norway, where the bulk of its vinyl chloride monomer is produced. If the study proves positive and construction is approved, plans to expand the company's Newton Aycliffe plant in the north-east of England would be shelved and production of suspension-grade PVC at Porsgrunn, Norway, would be closed down.

The company has said that it expects production of paste-grade PVC at Porsgrunn, currently 20,000 ton/year, would be maintained. Norsk Hydro has been considering a series of options to expand its suspension-grade PVC capacity by around 100,000 ton/year for several months.

The company's VCM capacity stands at 580,000 ton/year, but only 350,000 ton/year is currently used captively. The balance is sold to other PVC producers. Detailed design studies have already been completed for expansion of the UK plant, and planning permission was obtained early this year. Aycliffe is closer to the European market, with the added advantage of existing production, a spokesman said, but Rafnes offers the opportunity of a fully integrated plant. Currently, Rafnes supplies VCM to both Aycliffe and Porsgrunn. The company says it expects to make a decision within a year, depending on the outcome of the Rafnes study and gaining planning permits. Environmental opposition to chlorine-based polymers, such as PVC, is likely to be stronger in Norway than in the UK.

## SASOL BOARD REVIEWS OPTIONS

The board of Sasol, the South African coal-to-chemicals giant, was meeting to review the company's investment plans over the next five years.

Around 20 greenfield projects are currently under consideration for the Sasol Two and Sasol Three sites at Secunda. These would require a total investment of over Rand 3bn ($1.1bn) and would have a turnover of Rand 1.8bn/year. The company is also expected to finalize plans for the revamp of Sasol One, its oldest manufacturing site at Sasolburg, as part of strategy to move from synfuel to chemicals production.

Sasol One will continue to produce industrial gases and be revamped to produce high value added chemicals which are making the largest contribution to Sasol's earnings growth. A high priority is the design of a new technology for special wax and chemicals production. Industry sources believe the managing contract for the revamp will go to either Badger or Fluor Johannesburg.

## TESSENDERLO CHEMIE FORMS ZEOLITES JV

The Belgian companies, Tessenderlo Chemie and Societe Chimique Prayon-Rupel, are to form a 50:50 joint venture company to produce zeolites, used in detergents formation.

A zeolite production unit with a capacity of 60,000 ton/year is to be built. The products will be manufactured using a process developed US concern, W R Grace. Caustic soda, a key raw materials in zeolite production, will be supplied by Tessenderlo.

A final decision on the location for the plant has not yet been made, but it seems likely to be at Prayon-Rupel's existing site at Engis, near Lieges. The project, which will involve a total investment of BF 1bn ($28.9m), is due to begin immediately, with industrial
scale production starting in the
quarter of 1991. It represents th
venture in the zeolite sector fo
companies.

## DOW CONFIRMS $40M PS INVESTMENT

Dow Europe has confirmed its i
tion to build a new 90,000 ton/yea
lystryene train at its Tessenderlo,
gium site. The train, which will be
along-side an existing train of the
capacity, will come onstream du
the second quarter of 1992. It wi
capable of producing both crystal
impact grades of Styron polystyre

Studies to determine the scope o
project have been underway since e
1989. Engineering design work is
being finalized. Contractors will
appointed in the next few months
construction to begin early next y

The new train, estimated to repres
an investment of around $40m, is lin
to the closure, over 2-3 years of ol
capacity, dating from 1963 and 1965
Terneuzen in the Netherlands. Over
the investment will result in 10-20
cent increase in the company's Eu
pean capacity, which will then be clo
to 500,000 ton/year.

## CEPSA FORMS CANADIAN LA JV; INVESTS IN ACRYLATES

Petresam, a subsidiary of the Spa
ish concern Cepsa, has formed a 70:3
joint venture with the Canadia
government-owned Societe Generale d
Financement to construct and operate
linear alkybenzene (LAB) plant i
Quebec province.

The Pta 10bn ($97.2m) plant wil
have a capacity of 75,000 ton/year t
cover market demand in North America for LAB, the basic raw material fo
bio-degradable surfactants. A site is
being sought in the St Laurent area.
Construction is expected to start in
around six months time, with comple

set for late 1992. The plant will use w fixed-bed alkylation technology eloped jointly by UOP and Cepsa, claimed to offer reduced capital ts and environmental benefits over ventional processes. Petresa cur- tly operates a 180,000 ton/year LAB nt at San Roque, Spain.

n a separate move, Cepsa has formed luquimica, a 60:40 venture with Dai- ppon Ink and Chemicals of Japan to oduce 40,000 ton/year of acrylic id/acrylic ester and related products its Algeciras refinery, southern Spain, supply the southern European mer- iant market. Technology for the Pta 2bn project is being provided by Dai- ppon. Work is expected to start within e next six months, with the complex ue onstream in late 1922. The agree- ment is Cepsa's second with Dainippon: e first is Reichhold Chemie, in which epsa has a 40 per cent stake and Dai- ippon 60 per cent.

## XXON WINS MOSSMORRAN GO-AHEAD

The secretary of State for Scotland is expected to give the formal go-ahead for expansion of the Fife ethylene plant at Mossmorran within a month, following outline planning approval from the Fife regional council's planning committee. The $40m expansion will introduce feedstock flexibility to enable the plant to run on both propane and butane in addition to ethane. This will improve the long-term security of feedstocks to the plant and thus its long-term viability, says operator, Exxon Chemical.

Production of ethylene will be increased from 650,000 to 900,000 ton/year. In addition, production of 200,000 ton/year of polymer-grade propylene will be introduced. Exxon will share the costs jointly with partner Shell Chemical. Final approval by the boards of both companies is expected before the end of the year, with completion of the project now scheduled for mid-1993. M.W. Kellogg is acting as the main engineering contractor, but under the terms of the contract is not responsible for the furnaces and cogeneration units. Bids for the furnaces are now out, with a decision expected in early autumn. The existing furnaces were designed and built by Badger and Birwelco. The contract for the cogeneration units will be awarded at a later date. The expansion demonstrates the intention to make the Fife plant a site for development and growth, an Exxon spokesman said. However, there is "nothing in prospect" as yet on downstream plastics production at the site, he said.

## AKZO JV INVESTS IN OLEOCHEMICALS

Akzo & Pacific Oleochemicals, a 50:50 joint venture between Akzo and Lam Soon Malaysia/Johor State Economic Development Corp, is to invest Ringgit 40m ($14.8m) in a new oleochemicals plant at its existing manufacturing site in Johor. Construction will start in the third quarter of this year, with completion expected by mid-1992. The plant will use Lurgi technology to process palm kernel and palm oil into distilled and fractionated acids and refined glycerine. A substantial part of the output will be used captively by the parent companies and exported to Europe, Japan and the U.S.

## TOYO WINS STYRENE MONOMER CONTRACT

Japan's Toyo Engineering has been awarded a $7m contract to build a 100 000 ton/year styrene monomer plant 100km west of Jakarta for the Japanese/Indonesian joint venture company PT Styrindo Mono Indonesia.

Under the contract, Toyo is to provide engineering, procurement and construction services. Construction is set to start later this year, with completion scheduled for autumn 1992. Technology is being supplied by ABB Lummus.

For Your Requirements Of:

**BENZYL CHLORIDE**
**BENZOYL CHLORIDE**
**BENZO TRI CHLORIDE**
**BENZALDEHYDE**

Contact Manufacturers:

**Shubham Aromatics Limited**

Factory:
Birlagram,
NAGDA (MP) 456 331
Phone: 283/104

Regd. Office
29, Bank Street, Ist Floor,
Bombay 400 023.
**Phone: 2862453/2863021**
**Gram: "METALDIST"**
**Telex: 011 - 6554 MINA IN**

# News From Japan

## PLANT EXPORTS HIT ALL-TIME HIGH OF $12.7 BILLION: MITI .

Ministry of International Trade and Industry (MITI) has announced Japan's plant-export figures for fiscal 1989 and also given estimates for fiscal 1990 plant exports. The value of plant-and-equipment exports in fiscal 1989 is given as $12.67 billion. Being 60.4% up on the previous year, this result marks an all-time record. This is also the first time in seven years (since 1982) that plant-and-equipment exports went above $10 billion.

The estimated value of plant and equipment exports for fiscal 1990 is put at 8.8% less than the 1989 figure with a total value of $11.56 billion. Although this means a decline in plant export growth for fiscal 1990, the tightness in the petrochemical market encourages hopes for major projects to be worked out in the petroleum-refining and petrochemical-plant areas so that the future is seen in optimistic light, suggesting a continuing boom.

The rise in plant exports during fiscal 1989 is due primarily to increased plant exports to the Near and Middle East, accounting for a value of $3.61 billion. This meant that plant exports to this part of the world rose by more than seven times. This must be seen in the light of the cessation of hostilities between Iraq and Iran leading to a reactivation of demand mainly in the form of a series of big projects emerging.

Plant exports to Asia were also significantly up by a factor of five to reach a value of $ 6.47 billion. This favorable export performance is due to the prosperous economic development in the ASEAN countries, helped along by the booming economies of the advanced industrialized nations. Exports to these two regions of the world account for a little under 80% of the total export figures.

Though chemical plants have dropped by 14 to reach 92, there has been a series of orders for major projects in the Near and Middle East, with a total value of $3.37 billion or 51% more than in the previous fiscal year. In the electrical machinery and equipment sector, too, plant exports to Asia and the Near/Middle East were brisk, with a series of orders received for big projects worth more than $100 million (139 projects). This brought the total value of plant exports in the electrical machinery sector up to $4.7 billion, a 2.2-fold increase over the previous fiscal year. In the textile field, plant exports to the Communist Bloc countries have dropped to half their previous level so that exports as a whole were significantly down. The total number of export projects was 835 or 35 projects fewer than in the previous fiscal year.

The estimates for plant exports in fiscal 1990 are optimistic with an expected revival of demand for plants including petrochemical plants. This concerns those of the nations with accumulated debts, that is, countries such as the Central and South American states for which financing is being re-opened. By geographic region, Asia ranks top at $5.89 billion (with a 51% share), followed by the Near and Middle East at $1.9 billion (with a 16.4% share), Central and South America at $1.11 billion (9.6% share), and Africa at $1.05 billion (9.1% share).

## DAICEL, HOECHST TO BEGIN JV IN U.K. FOR NONFLAMMABLE RESIN

Daicel Chemical Industries Ltd. has agreed to set up a joint venture with Hoechst AG — the West German chemical giant — in Britain in late August. The new company is scheduled to build a 3-4,000 t/y plant for nonflammable ABS resin in mid-1991 at earliest. As a first step, it will import the product from the Japanese firm and market it using Hoechst's distribution network. The product will be suppl mainly to Japanese firms operating Europe.

Demand for ABS resin on the market stands at 530,000 tons a ye (Japan 560,000 t/y) including rough 20,000 tons a year of nonflammab products. Nonflammable ABS resin in brisk demand there for use in bu ness machines including printers a computers. Its demand is projected increase at an annual rate of 7%.

Daicel and Hoechst have hither maintained a close relationship wi each other through operation of Pol plastics — their joint-venture fir located in Japan.

Daicel has already begun commercia production of nonflammable ABS resi in Taiwan and the United States. I 1987 the company together with Kishimoto Sangyo Co, — set up Daice Kisco in Taiwan: the joint company i running a 5,000-t/y plant. In 198 Daicel took over a plastics converter o the United States, thus launching int production of (nonflammable) ABS resin and engineering-plastics alloy. The U.S. subsidiary recently completed a 3,000 t/y plant for ABS resin.

## TORAY CARDIOVASCULAR DRUG TO BE MARKETED IN EUROPE BY ROUSSEL UCLAF

Toray Industries, Inc. has announced that it has sold the sales rights for its "TRK-100" prostaglandin $I_2$ ($PGI_2$) agent — or prostacyclin one — for Western Europe to Roussel Uclaf S.A. of France. The oral agent — beraprost sodium — jointly developed with Kaken Pharmaceuticals Co. has proved effective against chronic arterial occlusion and Raynaud disease.

The company applied last September for manufacturing approval for TRK-100 and has teamed up with Yamanouchi Pharmaceutical for sales in Japan and with Marion Merrel Dow, Inc. of

U.S. for Canada and the States. The iprost-sodium preparation will thus narketed on both the European and erican continents, plus Japan.

n Japan, it will be separately mar- ed by Toray Medical Company, nanouchi and Kaken. Toray's ber- ost sodium is the world's first oral stacyclin. It has been known that the stance acts to maintain the organic ance of the human body, although its ical applications have been limited its chemical instability.

## RST DOMESTIC PRODUCTION Nd, Pr SCHEDULED

The Taiyo Mining & Industrial Co. s announced that it will industrialize production of neodymium (Nd), ich has been showing a sharp mand increase recently as a material rare-earth permanent magnets, and aseokymium (Pr) said to be raw aterial for next-generation rare-earth rmanent magnets.

Utilizing technology gained through ltivating rare-earth business over a ng time, the company has developed d and Pr separation and extraction chnology by itself. Both products are ailable only in the form of imports at esent and therefore will be manufac- red in Japan for the first time.

The new factory is to be constructed Fukui Shinsozai's factory site (Fukui refecture). Fukui Shinsozai, a company filiated with The Taiyo Mining & dustrial Co., has specialized in rare- arth operations.

The company will start constructing e factory this September with opera- on start-up scheduled for next spring. the initial year 75 tons of Nd and 25 ons of Pr will be manufactured. In 992, the following year, 150 tons of Nd nd 50 tons of Pr will be produced.

As its new business, the company is xpanding rare-earth operations. Taking advantage of the opportunity offered by manufacturing Nd and Pr in Japan for the first time, the company — in close co-operation with its group enterprises — intends to become an integrated rare-earth manufacturer.

## MITSUI PETROCHEMICAL BUILDS PLANT FOR VERY STRONG PP SPUNBOND

Mitsui Petrochemical Industries, Ltd., has constructed in Yokkaichi a 3,000-t/y plant for extremely strong PP spunbond and has begun cultivating its market here for use as "geotextile" in construction and civil engineering work. The plant is built on the site of the Yokkaichi factory of Sunrex Industry Co., a subsidiary owned 100% by Mitsui Petrochemical.

The polypropylene (PP) spunbond trademarked "Tafnel EX" is three times as strong as conventional products; the company bought the manufacturing technology for it from an Austrian company. It says the strong nonwoen fabric is effective when used for — in particular — railway construction, shore protection and land-reclamation works.

Tafnel Ex production is in line with another of the company's PP-spunbond plans under which the current 5,000-t/y capacity will be increased to 12,000-t/y by next spring. The company has also revealed a plan for another expansion of 6,000-t/y in two to three years.

Japanese demand for spunbond nonwoven fabrics is estimated at about 30,000 tons a year, about 20% of which is used for civil-engineering works. This use has been rising at a rapid year-on-year increase of around 20% over the last few years.

Both PP and PET spunbonds are used for civil engineering and construction but it is said that PP spunbond is more suitable for this purpose in view of the fact that it absorbs no moisture, has higher alkali and acid resistance and is easier to use.

## CAUSTIC SODA PRODUCTION TOPS 3.7 MIL. FOR FIRST TIME

Production of caustic soad in fiscal 1989 registered 3,731,634 tons, a 4.9% rise over the previous fiscal year, hitting an all-time high. Domestic demand continued to be favorable and total deliveries (including exports) recorded 3,730,016 tons, a 4.8% gain over the preceding fiscal year. Reflecting the brisk domestic demand, exports were limited to 308,840 tons, almost a double-digit decrease from the previous fiscal year. Japan's real operation capacity in March this year was 3,907,000 tons, indicating that Japanese manufacturers have endeavored to increase caustic-soda supply in various ways by means of efficient production.

Caustic-soda prodution had recorded about 3,000,000 tons every year — with the exception of 3,200,000 tons in 1973 and 1979 — until 1988 when 3,500,000 tons were manufactured for the first time. In fiscal 1989, 3,700,000 tons were produced for the first time because of increased domestic demand centered on the chemicals field.

Regarding deliveries, captive use registered 1,048,323 tons, a 2.8% increase over the preceding fiscal year and sales including exports recorded 2,681,693 tons, a 5.7% rise, totaling 3,730,016 tons, a 4.8% gain. Thus, as in the case of production, deliveries hit an all-time high.

Production is restricted throughout the world because of pollution regulations such as those for CFCs, and the supply-and-demand situation for caustic soda has become tighter and tighter. Therefore, export enquiries from overseas have become active. However, exports were limited to 308,840 tons because of Japanese manufacturers' domestic-demand-first policy, showing a sharp decrease of 9.7% from the previous year.

Japan's real operation capacity for caustic soda in March 1990 was-as stated before — 3,907,000 tons and a high operation rate has been maintained. The problem of the general tight supply-and-demand situation has not been solved.

Soda-ash production registered 1,115,579 tons, a 2.4% rise over the previous year, recovering the 1,100,000-ton level. With regard to deliveries, captive use recorded 221,028 tons, a marked increase of 12.4% over the preceding year. In contrast, sales including exports registered 886,369 tons, a 2.1% gain. Exports recorded 52,645 tons, a sharp drop of 53.4% from the previous fiscal year.

Regarding production of the major chlorides, synthetic hydrochloric acid registered 577,993 tons, a 1.9% gain over the previous fiscal year; liquid chlorine, 1,016,706 tons, a 2.8% rise; bleaching liquour, 45,964 tons, a 1.5% drop; and high test hypochlorite 39,219 tons, a 9.5% increase.

## CAPACITY BUILD-UP FOR TEREPHTHALIC ACID UNDER WAY IN EASTERN ASIA

A total of five plants for high-purity terephthalic acid (PTA) are scheduled to be put into commercial operation by this fall in Japan, S. Korea and Taiwan. For example, Mitsui Petrochemical Industries (Japan) plans to inaugurate in July full-scaale operation of a new 250,000-t/y plant at its Ohtake factory. CAPCO (Taiwan) is due to start running — also in July — its No. 4 plant (output 250,000 t/y) and Kohap Chemical plans to begin in October operation of a new 150,000-t/y plant. It is forecast that S. Korea's production capacity for PTA will exceed domestic demand by considerable margin by the end of this year and Taiwan's imports of the product will drastically dec

In S. Korea, Sam Nam Petroch cal started last April operatin 200,000-t/y plant. Samsung Petroch ical is tackling capacity build-up f 500 to 600,000 tons a year with c pletion scheduled for next year. S yong Industry is implementing a p for building a 160,000-t/y plant.

S. Korea's production capacity PTA at the end of the this year amount to 970,000 tons a year, 430, tons more than the preceding yea level. Her demand for the product total 940,000 tons a year, up 16% o the preceding year, reflecting a busin pick-up for polyester. As a resu imports will be halved to 170,000 to showing a conspicuous rise compar with the preceding year's result of or 6,000 tons.

In Taiwan, FCFC is scheduled start this fall operation of a 200,000-t plant which has already been complete The country's PTA capacity will reac 950,000 tons, 360,000 tons higher tha the 1989 level, while demand for th product will stand at 1.18 million ton up 7%. Imports will drastically declin from the 520,000 tons registered la year to 230,000 tons. It is believed tha Taiwan's PTA capacity will top he domestic demand by the end of thi year.

Japan's PTA production will amoun to 1.29 million tons this year. Exports of the product will increase by 60,000 tons to 510,000 tons given domestic demand totaling 780,000 tons.

PTA will be in oversupply in East Asia for certain for some time towards the end of this year. A sharp decline will be seen for exports there from the U.S., Britain, Spain, Mexico and Japan. On the other hand, there are moves towards scaling up production of p-xylene, raw materials for PTA, in Japan (up 670,000 t/y), S.Korea (up 560,000 t/y) and Taiwan.

SEQUESTERING/CHELATING AGENTS
EDTA
DTPA
NTA
AND ITS SALTS
NB: OUR PRODUCTS CAN REPLACE METACLAW/CHELASHOK/ACINOL/SUPERQUEST/TRILON/VERSENE BRAND SEQUESTERING/CHELATING AGENTS
MFRS : SONY CHEMICALS
1/2 DARSHAN UDYOG BHAVAN,
SAFED PUL, M.V. ROAD,
BOMBAY 400072.
PHONES : 5136822/5120926/5120713
GRAM : NEWGENER
TELEX : 011-72398 SOC IN

**FOR YOUR REQUIREMENTS OF:**

**AGNESIUM SULPHATE Crystals/Tech/I.P./L.R. Grade**
**AGNESIUM SULPHATE Dried/Anhydrous all Grades**
**AGNESIUM CHLORIDE PHARMA GRADE**
**LUM (Non-Ferric) Anhydrous**
**INC SULPHATE PHARMA GRADE**
**INC CHLORIDE**
**ALCIUM CHLORIDE Fused/Anhydrous**
**ODIUM SULPHIDE**
**ODIUM BISULPHITE**
**ODIUM SULPHITE**
**ODIUM META BISULPHITE**
**IYPO**

Please Contact Manufacturers:

**MERCERS CHEMICAL INDUSTRIES (INDIA)**
**MAG-PHARM INDUSTRIES**
231, Samuel Street, Vadgadi, Bombay 400 003.
*Regd. Off.: 32, Pais Street, Byculla (W), Bombay 400 011.*
**Telephones: 377760/343117** **Grams: 'LAXNAGAR'**

**A TRUSTED & PROVEN NAME**
**TO MEET YOUR REQUIREMENTS OF**
**SEQUESTERING/CHELATING AGENTS**

**EDTA**

**EDTA PURE ACID**
**EDTA DI SODIUM**
**EDTA TETRA SODIUM**
**EDTA TETRA SOLUTION**
**EDTA FERRIC SODIUM**
**EDTA FERRIC AMMONIUM**
**NTA**

Contact Manufacturers

*New Alliance Dye.Chem. Pvt. Ltd.*

**Office:**
C/o. P.V. Kamat & Co.
12, Khandelwal Bhavan,
166, Dr. D.N. Road, Bombay 400 001.
**Phone: 2040024**

**Factory:**
K-63, M.I.D.C. Tarapur,
Post-Boisar, Dt. Thane.
Pin: 401 506

AVAILABLE
INDIAN AND IMPORTED

**OIL LEMON**
4% Cital
**OIL BERGAMOT**
**GERANIUM OIL**
**OIL ORANGE**
4% Cital
**CARDAMUM OIL**
100% Pure & Natural Sweet
Double Distilled
**CARDAMUM EXTRACT**
100% Pure & Natural

*DEALERS ENQUIRIES SOLICITED*

* * *

**SYNTHETIC POLYESTER RESIN (35/210 KG)**
Grades
G.P. -- Car Patch
Choke -- Marble
F.R.P. -- Rooflite
Isophthalic Polyester Resin
Isophthalic Gel Coat
G.P. Gel Coal
(For Surface Finishing)

* * *

*Available Solvents*

**TOLUENE/BENZENE/XYLENE**
**HEXANE/I.P.A./ACETONE**
**M.E.K./DIACETONE/EDC**
**CYCLOHEXANONE/STYRENE**
**ETHYL ACETATE/CIX**
**TRICHLORO ETHYLENE**

**UNITED CHEMICALS**
WE MEAN BUSINESS

6, Shrinathji Sadan,
64, V.V. Chandan Street, Masjid,
BOMBAY 400 003.

Tel: 328795
Gram: SPEEDCHEM, Bombay 400 003.
Telex: 011-2846/011-2575/CTO-BY-IN
Attn: TD-132
Fax : 022-2024202, 022-2024001
Attn: AC-163

**Available Regularly at Most Competitive Prices**

- Acetone
- Acetic Acid Glacial
- Aluminium Sulphate
- Butyl Acetate
- Butyl Acrylate Monomer
- Carbon Tetrachloride
- Caustic Soda Solid/Flakes
- Copper Sulphate
- Citric Acid
- Di Ammonium Phosphate
- Di Ethylene Glycol
- Formaldehyde
- Formic Acid
- Gohsenol GH-17
- Gold Bronze Powder
- Hydrogen Peroxide
- Hydrosulphite of Soda
- MCA (Monochloro Acetic Acid)
- N Butyl Alcohol
- Oxalic Acid 98/99%
- P.V.A. 173, P.V.A. 208
- Polyethylene Glycol
- Potassium Carbonate
- Potassium Bichromate
- Rangolite C
- Sorbitol Liq.
- Sodium Bicarbonate
- Sodium Alginate
- Sodium Bichromate
- Sodium Nitrite
- Sodium Perborate
- Sodium Sulphide Flakes/Solid
- Sodium Meta Silicate
- Titanium Potassium Oxalate
- Titanium Dioxide
- Trisodium Phosphate
- Triethanolamine
- Urea Technical Grade
- And other chemicals

Please Contact

**TRIBHOVANDAS KHIMJI & BROS**

Mangaldas Building No. 5,
36, Trikamji Ghia Marg,
(Kitchen Garden Lane)
Bombay 400 002
**Phones: Off.: 310132/311385**
**Resi: 355044**
**Grams: "SARKEV", Bombay-2**

*MORE THAN 70 YEARS OF SERVICE TO VARIOUS INDUSTRIES*

Chemicals Available in Ready Stock (200/30 kg.)

*STOCKIST*

**TRIETHANOLAMINE 98%**
**DIETHANOLAMINE 98%**
**MONOETHANOLAMINE 97%**
**OLEIC ACID**
(Emulsonic & Tech. Grade in kgs.)
**TRIETHYLAMINE 98%**
**PROPYLENE GLYCOL**
**LACTIC ACID 88%**
**FORMALDEHYDE 37%**
**STYRENE MONOMER**

**ATUL CHEMICALS**

*Sales Office*: 63/B, Princess Street, Devkaran Mansion, 2nd Floor,
BOMBAY - 400 002.
Telephone: 319510 / 316366; Resi: 8227125

***For Your Requirements Of:***

**REACTIVE DYES**
**REMAZOL DYES**
**RAPID FAST DYES**
**RAPIDOGENS**
**RAPID FAST SALTS**
**SODIUM BISULPHATE**
**POTASSIUM BISULPHATE**

**Please contact manufacturers:**

**TIME CHEMICALS PVT. LTD.**

"HARI-ICHHA"
A-23/92, Rajawadi Co-Op Housing Society,
Rajawadi, Bombay 400 077.
**Telephone No. Off.: 5121709**
**Resi.: 5123597/5121246**

AVI

ACME'S ADSORBENTS
FOR

THIN-LAYER CHROMATOGRAPHY
SILICA GEL - G & $GF_{254}$
SILICA GEL - H & $HF_{254}$
CELLULOSE POWDER - G
KIESELGUHR - G
MICROCRYSTALLINE CELLULOSE

COLUMN CHROMATOGRAPHY
SILICA GEL of all Mesh Sizes
ALUMINIUM OXIDE ACIDIC,
BASIC & NEUTRAL
CELLULOSE POWDER
KIESELGUHR

AND TAILOR MADE SILICA GELS FOR SPECIAL APPLICATIONS
TLC EQUIPMENTS AND U.V. CHROMO-CAB (U.V. LAMP)
LIPID CHEMICALS OF 99+% PURITY, SODIUM CAPRYLATE,
UNDECYLENIC ACID & HEPTALDEHYDE
Manufactured by

asc **acme synthetic chemicals**
308, Veer Savarkar Marg, Bombay 400 028.
Telephone: 465127 - 452706 * Gram: ACMESOAP

- **Spindle Oils, Metal Working Oils, drawing compounds and speciality mineral White Oils.**
- **Naphthenate & Octate Driers, Offset Ink Media, Letter Press Varnishes, Synthetic Drying Oils for Paint and Printing Ink Industries.**
- **Copper and Zinc Naphthenates as Fungicides and Wood Preservatives.**
- **Synthetic Pine Tar and Process Oils, Mould release & Separating Agents and Micraffins for Rubber Industries.**
- **Petroleum Jellies: White, Pale Yellow and Amber and Speciality Waxes.**
- **Wax Emulsions and auxiliaries for Leather, Paper, Textiles and Wood Industries.**
- **Hard and Synthetic waxes for use in Polishes, Castings, Carbon Paper, Adhesives, Coatings etc.**
- **Petrochemical Specialities: Mahathol Calibration Oil for Diesel Injection Test Benches; Additives for fuels and lubricants.**

Manufacturers:

MAHATHA PETROCHEMICALS (Estd. 1969)
*(Manufacturers of Speciality Oils, Waxes, Additives etc.)*
Sree Meenakshi Gardens, Kizhakattalai, Old Pallavaram P.O. Madras 400 043.
**Grams: PETROCHEM Phone: 431542**

ACTIVATED.
SODIUM PENTACHLOROPHENATE (ACTIVATED SAGINOL SP.)

Complying to I.S.I. Specifications

Being activated three times more effective than normal
SODIUM PENTACHLOROPHENATE
Cost reduction to consumers having excellent results as preservatives

Please write to original manufacturer

(ESTABLISHED IN 1960)

SAGGITAR and DEMOR

Kailas Road, Post Box No. 16, Bulsar 396 001.
Telephone No.: Off.: 2456/2917 Resi.: 3422/2723
Bombay Phones: 4113885/4111769; 234310/2045575

For Your Requirements Of:

**META DI NITRO BENZENE**
**META NITRO ANILINE**
**META AMINO ACETANILIDE**
**4 NITRO 2 AMINO PHENOL**

CONTACT MANUFACTURERS

***Mangalam Organics Pvt. Ltd.***

Regd. Office 292, Princess Street, 2nd Floor, Near Flyover, Bombay-400 002
Gram: DHOOTUDYOG • Phones 317969 • 317411 • 317489 Telex 011-4643 MRPL IN

Factory: Plot No. 1203, G.I.D.C., VAPI, Dist. Valsad, Gujarat, Phone: 930 Telex 183-256 SMPL IN.

Acrylo-Aceto Nitrile
Allyl Alcohol
Allyl Chloride
1,4 Butane Diol
B.H.A.
B.H.T.
T.B.H.Q.
Sorbic Acid
Calcium Propionate
Cresyllic acid
Coconut Di Ethanolamide (Imported)
Chloro Hexedine Gluconate 20%
Calcium Chloride
Carbon Disulphide
Caprolactum
Carbitol/Butyl Carbitol
Cyclohexanone/nol
Cyclohexane
Cyclohexylamine
Mono- Di-Tri Ethanolamine
Mono- Di-Tri Ethyl Amine
Iso Propyl Amine 99%
Iso Propyl Myristate (Imported)
Iso Octane 99%
N. Heptane 99%
N. Hexane 99%
N. Pentane 99%
Ethylene Chlorohydrine
Ethylene Diamine
Lithium Hydroxide
Lithium Carbonate
Oleyl Alcohol
Nitro Methane
Moly-Disulphide
PVP K-30
Pot. Carbonate
Sod. Hypochlorite Soln. (8 to 10%)
Solvent Naphtha (Light & Heavy)
T.H.F.
T.E.G. (Indian/Imported)
Thioglycollic Acid
Calcium Hydroxide (Extra Pure)
Tert. Butanol
Distilled MEG

Contact:

**HARIBHAI JEEBHAI & CO.**

22, S. Gandhi Marg, (Princess Street), Bombay 400 002.
Tel. No: Off.: 312116-315999-254950-253945 Resi: 6207314-6207791
Telex: C/o. 011-3185 ABC IN

**WITH MODVAT**

# MARKET INFORMATION

## oda Ash Up: Intermediates Steady

umours of manufacturers raising es pushed up prices of soda ash. cks of acrylamide/butyl acrylate e easily available. Though prices e not gone down, supply position eased considerably. Arrival of GH-17 has also eased pressure on supplies. The dyes intermediates prices remained steady, with prices of MNA reducing to Rs. 125 and DNA reducing to Rs. 85, cyanuric chloride also eased to Rs. 150/kg.

**We cannot guarantee the accuracy of the prices published in CHEMICAL WEEKLY as they are based only on the enquiries made by our correspondent -- and, as such they are not FIRM PRICES as between a buyer and seller. The prices are published only with a view to giving some ideas of the market conditions.**

**The prices are inclusive of Excise and Maharashtra Sales Tax.**

**(Prices as on July 31, 1990)**

| USTRIAL CHEMICALS | Per Kg. |
|---|---|
| monium sulphate | 2.50 |
| monium phosphate (Mono) | 14.50 |
| monium phosphate (Di) | 14.50 |
| monium carbonate (Di) | 17.00 |
| monium bicarbonate | 6.00 |
| monium chloride | 3.25 |
| monium nitrate | 6.00 |
| senic white powder | 22+ST |
| rylamide (Resale) | 87.00 |
| rium carbonate | 20.00 |
| eaching powder (33% Cl) | 5.00 |
| Borax (Granular) | 16.00 |
| Borax (Powder) | 22.00 |
| Boric acid (Tech) | 32.00 |
| Bisphenol-A | 75.00 |
| Butyl carbitol | 106.00 |
| Caustic soda (Flakes) | 11.50 |
| Caustic soda (Solid) | 12.00 |
| Caustic soda (Lye) | 10.00 |
| Calcium chloride 70% (Solid) | 3.25 |
| Calcium chloride 75-80%(fused) | 3.50 |
| Calcium chloride 36% (Anhydrous) | 5.00 |
| Calcium carbonate (precipitated) | 6.00 |
| Calcium carbonate (Activated) | 5.75 |
| Cobalt oxide | 550.00 |
| Cresylic acid | 62.00 |
| Camphor (Indian) | 105.00 |
| Cream of Tartar (Tech.) China | 70.00 |
| Citric acid (Belgium) (Resale) | 47.00 |
| Citric acid (Indian) (Resale) | 41.00 |
| Copper sulphate | 24.00 |
| Chromic acid | 63.00 |
| Ethylene urea | 58.00 |
| Ferric chloride (Lumps) | 9.00 |
| Ferric chloride (Anhydrous) | 20.00 |
| Glue flakes | 15.00 |
| Glue sheets | 6.75 |
| Gohsenol GH-17 | 128.00 |
| Hydro | 39+ST |

Paints, Pharmaceuticals, Pesticides & Chemicals
Manufacturers for your Requirements of

NOCIL PRODUCTS

ACETONE
DIACETONE
ISOPROPANOL
N-BUTANOL
M.I.B.K.
IPA-CBM
ISOBUTANOL
E.D.C.
2-ETHYL HEXANOL
P.E.G. 200/300/400/600/1500
M.E.G.
D.E.G.

Please Contact: Authorised Distributors for Gujarat State.

SHREE AMBICA TRADING CORPORATION

Bombay Office:
813, Raheja Centre, 214, Nariman Point,
BOMBAY - 400 021
Phones: 240415/243979/2873680
Telex: 011-6053 SATC-IN

Ahmedabad Office:
4A-B, Trade Centre, Near Stadium House,
Ahmedabad-380 014
Phone: 462332/440084

| | |
|---|---|
| Hyflosupercell | 28.00 |
| Hexamine (Resale) | 36.00 |
| Industrial Wax | 25.00 |
| Litharge | 40.00 |
| Lead Acetate (Tech.) | 39.00 |
| Lithopone | 32.00 |
| Magnesium chloride (Crystal) | 2.00 |
| Menthol crystal (Flakes) | 355+Ex+ST |
| Menthol bold | 425+Ex+ST |
| Menthol crystal cold | 395+Ex+ST |
| Magnesium carbonate (Japan) | 30.00 |
| Magnesium carbonate (Indian) | 26.00 |
| Maleic Anhydride (Resale) | 42.00 |
| Mercury (34.5 Kgs) | 11,500.00 |
| Nickel chloride | 110.00 |
| Oxalic acid (Resale) | 15.25 |
| Peppermint oil (Rectified) | 188+Ex+ST |
| Potassium carbonate (Indian) | 28.00 |
| Potassium carbonate (Imported) | 32.00 |
| Potassium bichromate | 38.00 |
| Potassium phosphate (Mono) | 34.00 |
| Potassium phosphate (Di) | 25.00 |
| Polyvinyl alcohol (No. 117) | 93.00 |
| Polyvinyl alcohol (No. 173) | 135.00 |
| Polyvinyl alcohol (No. 208) | 170.00 |
| Paraformaldehyde (Resale) | 20.50 |
| Phthalic anhydride 36% (Resale) | 33.00 |
| Pentaerythritol (Resale) | 49.00 |
| Paraffin wax | 22+ST |
| Rangolite (German) | 96+ST |
| Rangolite (Czech.) | 72.00 |
| Rangolite (China) | 54.00 |
| Sodium sulphate (Fine) | 3.75 |
| Sodium sulphate (Coarse) | 3.50 |
| Sodium sulphide 50-52% (Flakes) | 11.50+ST |
| Sodium sulphide 58-60% (Flakes) (TCL) | 25.00 |
| Sodium sulphide pure (Flakes) | 12.25 |
| Sodium nitrite (Resale) per 50 kg. | 1,200.00 |
| Sodium chlorite 80% (Spain) | 110+ST |
| Soda Ash (Tata) | 5.40 |
| Soda Ash (Birla) | 5.20 |
| Soda Ash (Imp.) | 4.50 |
| Sodium bicarbonate | 7.00 |
| Sodium bisulphite | 8.00 |
| Sodium silicate | 5.50 |
| Sodium acetate | 7.20 |
| Sodium alginate | 450.00 |
| Titanium Dioxide (Anatase) | 65.00 |
| Titanium Dioxide (Rutile -- $RCR_2$) | 88+ST |
| Tartaric acid | 190.00 |
| Trisodium phosphate | 12.00 |
| Thiourea | 78.00 |
| Urea (Tech.) | 3.00 |
| Vacuum salt | 1.00 |
| Zinc Dust | 52.00 |
| Zinc Oxide | 54.00 |
| Zinc chloride powder (Tech.) | 20.50 |
| Zinc sulphate | 7.00 |

| SOLVENTS | Per Kg. |
|---|---|
| Acetic Acid Glacial (Resale) | 13.00 |
| Acetic Anhydride (Resale) | 33.50 |
| Acetone (Resale) | 19.00 |
| Adipic Acid | 90.00 |
| Aceto Acetanilide | 55.00 |
| Aniline Oil (HOC) | 47.00 |
| Benzoate Plasticiser | 62.00 |
| Butyl acrylate | 80.00 |
| Butyl stearate | 38.00 |
| Butanol | 32.00 |
| Benzyl Alcohol | |
| Benzyl Chloride | |
| Benzo trichloride | |
| Benzoyl chloride | 3 |
| Bromine Liquid | 6 |
| Chloroform | 3 |
| Carbon Tetrachloride | 2 |
| Cellosolve | 5 |
| Cyclohexanone | 6 |
| Cyclohexanol | 58 |
| Diacetone (Resale) | 2 |
| Diethyl Oxalate | 3 |
| Diethyl glycol (DEG) | 25 |
| Dioctyl Phthalate | 4 |
| Diallyl Phthalate | 4 |
| Dimethyl Phthalate | 2 |
| Dioctyl Adipate | 5 |
| Dibutyl Adipate | 4 |
| Dipentene | 1 |
| Dimethylamine 40% | 30 |
| Dimethylamine 50% | 3 |
| Ethyl Acetate | 1 |
| Ethyl Acrylate | 72 |
| Ethylene Dichloride | 18 |
| Ethylene Glycol | 32 |
| Formic Acid (Imp.) | 24 |
| Formaldehyde (Resale) | 6 |
| Glycerine (CP) | 55 |
| Glycerine (IW) | 54. |
| Hydrogen Peroxide 50% (Resale) | 35. |
| Isopropyl Alcohol | 26. |
| Isobutyl Alcohol (Resale) | 35. |
| Monoethanolamine (Resale) | 95. |
| Melamine | 60. |
| Methyl Ethyl Ketone | 36. |
| Methyl Isobutyl Ketone | 38. |
| Methyl Acrylate | 68 |
| Methylene Dichloride (Resale) | 16. |

For Your Requirements Of:

Di Octyl Phthalate (D.O.P.)
Di Butyl Phthalate (D.B.P.)
Di Butyl Maleate (D.B.M.)
Di Octyl Maleate (D.O.M.)
Di Octyl Adipate (D.O.A.)
Butyl Stearate

Please Contact Manufacturers:

SAVITA ORGANIC CHEMICAL INDUSTRIES

1218, Dalamal Tower, Plot No. 211, Nariman Point, Bombay 400 021.
Phone: 230006, 231192, 233554, 233562

**IN GOD WE TRUST**

For Excellent Quality & Regular Guaranteed Supplies at Competitive Rates:

CALCIUM STEARATE
MAGNESIUM STEARATE BP 80
ZINC STEARATE
ALUMINIUM STEARATE
COPPER SULPHATE IP
DRIED ALUMINIUM HYDROXIDE IP
MAGNESIUM HYDROXIDE POWDER IP
ZINC CARBONATE

AND OTHER LABORATORY CHEMICALS

Contact Manufacturers & Exporters:

**ARUN INDUSTRIES**

303-A, Vrindavan, Ramachandra Lane, Malad (West), Bombay-400 064.
Phone: Office: 6820559/6820422 Telex: 011-78081 ARUN IN
Gram: "DEVOTION"

WE ARE REGISTERED WITH D.G.S. & D

FOR YOUR REQUIREMENTS FROM READY STOCK

ACETONE
DIACETONE
N-BUTANOL
ISOBUTANOL
D.E.G. / E.D.C.
BENZENE / M.E.G.
M.E.K. / M.I.B.K.
TOLUENE
SODIUM FORMATE
IPA-CBM
XYLENE (ORTHO/PARA/MIX)
SOLVENTS C-IX (CRUDE)
NITROBENZENE
FORMALDEHYDE (37% HOC)
PHENOL (LIQUID/CRYSTAL)
ETHYL ACETATE
BUTYL ACETATE
ACRYLONITRILE (ORIGINAL/REPACK)
N-HEXANE FOOD GRADE
ANILINE OIL
FORMIC ACID (IMP)
PROPYLENE GLYCOL
STYRENE MONOMER
VINYL ACETATE MONOMER
and all kinds of SOLVENTS & CHEMICALS

Please Contact:

**Hiren Chem Corporation**

306, Adamji Building, 3rd Floor, 413-Narshi Natha Street, Bombay 400 009.
Tel: 343426-333692-338139. (R) 5604922.
*Branch Office:* SHINE PHARMA CHEM
D/422-B.G. Tower, 4th Floor, Opp. Delhi Darwaza, Shahi Baug Road, Ahmedabad 380 004. Tel: 20959-24186. (R) 67003-68229

For Your Requirements Of:

**BON ACID * BETA NAPHTHOL**
**SODIUM SULPHITE (Crude)**

Contact Manufacturers

**MULTI ORGANICS PRIVATE LIMITED**

K-208, Keshava Bldg., 2nd Floor, Bandra-Kurla Commercial Complex,
Behind Drive-in-Theatre, Bandra (E), Bombay-400 051.
Phone Nos.: 6407778/6424736 Gram: MULTIORG, Bombay-51
Telex: 011-74530 MOL IN

Factory: A-1, MIDC Industrial Area, Chandrapur-442 401 (M.S.).
Phone: 7-54 Telex: 716-213 MORG-IN

| | |
|---|---|
| Carbitol | 64+ST |
| Meta Cresol | 45.00 |
| Nitrobenzene | 19 00 |
| Nitric Acid (Conc.) (RCF) | 2 50 |
| Ortho Cresol | 30+ST |
| Phenol (Resale) | 36 00 |
| Propylene Glycol | 52.00 |
| Polyethylene Glycol (No.200) | 50 00 |
| Polyethylene Glycol (No.400) | 65 00 |
| Polyethylene Glycol (No.500) | 52 00 |
| Polyethylene Glycol (No.1600) | 54 00 |
| Polyethylene Glycol (No.4000) | 80 00 |
| Polyethylene Glycol (No.6000) | 85 00 |
| Para Cresol | 110.00 |
| Styrene Monomer | 42.00 |
| Sorbitol | 14 00 |
| Sulphuric Acid | 2 80 |
| Trichloroethylene | 26 00 |
| Triethanolamine (Resale) | 85 00 |
| Turpentine Oil (Germany) | 8 00 |
| Turkey Red Oil (50%) | 20 00 |
| Vinyl Acetate Monomer | 52 00 |

| SOLVENTS | Per Litre |
|---|---|
| Benzene | 11 00 |
| N-Heptane | 10 50 |
| N-Hexane | 11 00 |
| Methanol | 8 50 |
| Solvent Naphtha Heavy | 10 50 |
| Solvent Naphtha Light | 8 50 |
| Toluene | 11 75 |
| Xylene | 22 00 |

| DYES INTERMEDIATES (PRICES ARE WITHOUT TAX AND EXCISE) | |
|---|---|
| Alphanaphthylamine | 65.00 |
| Alpha Naphthol (Imp.) | 155 00 |
| Aceto Acetic Ester (Methyl) | 65.00 |
| Ammonium Molybdate | 210 00 |
| Anthraquinone | 140 00 |
| Anthranilic Acid | 75 00 |
| 2-Amino 4-Nitrophenol | 140 00 |
| Blue B. Base (Local) | 285 00 |
| Beta Naphthol (Atul) | 71.00 |
| Benzidine Dihydrochloride (BDH) | 76 00 |
| Bromamine Acid | 445 00 |
| BON Acid (Incl. of excise) | 140 00 |
| Chicago Acid (Atul) | 350.00 |
| Coach Acid | 52.00 |
| C. Acid (Imp.) | 210 00 |
| Cyanuric Chloride | 150 00 |
| 2,4- DNCB | 27 00 |
| Dihydrothio PTOS (Imp.) | 1,300 00 |
| Dimethyl Aniline | 64 00 |
| Diethyl Aniline | 145 00 |
| Diamino stilbene disulphonic acid | 155 00 |
| 3,3-DCB (Imp.) | 200 00 |
| Gamma Acid (Atul) | 205 00 |
| H. Acid (Atul) | 95 00 |
| G. Salt | 70.00 |
| Isophthalic Acid | 50 00 |
| J. Acid | 330 00 |
| J. Acid Urea | 440 00 |
| K. Acid | 110 00 |
| MPDS (German) | 185 00 |
| MNA | |
| Meta Ureido Aniline | 1 |
| MPD (Local) | 1 |
| MPD (Japan) | 1 |
| Naphthenic Acid | |
| N-Methyl J. Acid | 5 |
| N-Methyl Aniline | 1 |
| Naphthalene (Refined) | |
| Ortho Anisidine (OA) (Imp.) | 1 |
| Ortho Dichloro Benzene (ODCB) | |
| OT Base | 12 |
| Para Dichloro Benzene (PDCB) | 2 |
| Para Anisidine (PA local) | 13 |
| PNA | 8 |
| Para Cresidine (Imp.) | 38 |
| Para Amino Azo Benzene (India) | 13 |
| PNCB (HOC) | 5 |
| Para Amino Acetanilide | 20 |
| 1-Phenyl 3-Methyl 5-Pyrazolone | 14 |
| Phenyl J. Acid | 35 |
| Para Amino Benzoic Acid | 135 |
| PT Base | 135 |
| Rhoduline Acid | 520 |
| Resist Salt 80% | 28 |
| Resorcinol | 230 |
| Sodium Naphthionate | 65 |
| 5-Sulpho-Anthranilic Acid | 78 |
| Sulphanilic Acid | 33 |
| Sulpho Tobias Acid | 145. |
| Trichloro Benzene (TCB) | 22. |
| Tobias Acid (Imp.) | 138. |
| Metanilic Acid | 43 |
| MTD | 125. |

We Manufacture Chemicals For Industrial Use

- Acetic Acid
- Acetic Anhydride
- Acetaldehide
- Industrial Alcohol
- Monochloro Acetic Acid
- Ethyl Acetate
- Butyl Acetate
- E D T A
- N T A
- Carboxy Methyl Cellulose

ASHOK ORGANIC INDUSTRIES LTD.
406.Sharda Chambers, 33,Sir Vithaldas Thackersey Marg (New Marine Lines),Bombay-400 20
Phone : 252236 : 252256 : 317511 Gram : 'ASHOKBROS' Telex : 11-3853 AOIL IN

Also Please Contact:

Baroda : Phones : 324519-325769
Telex : 0175-597 AOIL IN
Ahmedabad : Phone : 78009
Ankleshwar : Phone : 2461-2462
Telex : 0189-238 AOIL IN

New Delhi : Phones : 5710733-5711057
Calcutta : Phones : 282474-282475
Telex : 021-7917 SBIL IN
Madras : Phone : 582046
Telex : 041-7527 SBIL IN

Bangalore : Phones: 570746-570760
Telex : 0845-8275 SBIL IN
Hyderabad : Phones : 73737-831049
Poona : Phone: 50797

Plants at : Nandesari - Baroda; GIDC Ankleshwar; Boridra - Bharuch

SULPHUR

SULPHUR POWDER RUBBER GRADE
99.5 to 100% pure, free from A.S.T.
THREE WHEELS BRAND

THREE WHEELS

SULPHUR POWDER EXPLOSIVE GRADE
99.5% pure, free from A.S.T.

AGRICULTURE DUSTING POWDER
SULPHUR DUST 85% DP
KISAN BRAND

OUBLE REFINED ROLL SULPHUR & AMLASAR (CRYSTAL SULPHUR)

Manufacturers
M/s. V.A. CHEMICAL AND SULPHUR INDUSTRIES
8, Fancy Chambers, Plot No. 94, Surat Street, Bombay 400 009.
el. Nos: 346989/327244/320370 Telex: 011-76463 DVS IN Gram: SULFREFINE

ETHYL CELLOSOLVE * ETHYL CARBITOL
TRICRESYL PHOSPHATE * CELLOSOLVE ACETATE
BENZYL ACETATE FFC * BENZYL ALCOHOL FFC
SODIUM BI-SULPHATE * POTASSIUM BI-SULPHATE
METHYL CELLOSOLVE ACETATE
TRI PHENYL PHOSPHATE

For Your Requirement Please Contact:

tl trade link

5/363, Mangaldas Building, Trikamji Ghia Marg, 2nd Floor, BOMBAY - 400 002.
Phone: 297718/259487; Resi: 473310 Gram: 'POLOSIGHT' Telex: 4258 PTK IN

FOR YOUR REGULAR REQUIREMENTS OF

*META PHENYLENE DIAMINE 4-SULFONIC ACID
*4-NITRO, 2-AMINO PHENOL

EXPORT INQUIRIES SOLICITED

Please Contact :

VARAHI INTERMEDIATES

Plot No. 316, G.I.D.C., Behind Lion School, Phase I & II, Naroda, AHMEDABAD 382 330 ( Gujarat State - India )
Phone : 812002 / 813591

(KNS-ADI)

# Bombay Dyes Market

(Prices as on July 31, 1990)

| ACID COLOURS | Per Kg. |
|---|---|
| Acid Violet 4BS | *190.00 |
| Acid Maroon V | 110.00 |
| Acid Orange II | 112.55 |
| Acid Orange IIY | 93 85 |
| Acid Red A | 137.00 |
| Acid Scarlet 3R | 128.35 |
| Acid Red 3BN | *195.00 |
| Acid Red R2R | 132.00 |
| Acid Red RS | 88.00 |
| Acid Patent Blue AS | *280 00 |
| Acid Green V | *375 00 |
| Acid Coomasi Blue | 200 00 |
| Acid Yellow 5GN | 65 00 |
| Acid Red PG | 85 00 |
| Acid Red GRS | 78 00 |
| Acid Black 10 BX | 157.15 |
| Acid Black BX | 126 95 |
| Acid Black Wax | 135 50 |
| Crosein Scarlet MOO | 200 30 |
| Procinil Yellow GS (ICI, UK) | 265.00 |
| Procinil Red GS (ICI, UK) | 530 00 |
| Procinil Blue RS (ICI, UK) | 315 00 |
| Procinil Scarlet G (ICI, UK) | 600.00 |
| Procinil Orange G (ICI, UK) | 250 00 |
| Procinil Rubine (ICI, UK) | 550 00 |

* To get resale price add 6% tax

| DIRECT COLOURS | Per Kg. |
|---|---|
| Yellow 3GX | 114.00 |
| Gun Yellow RCH | 175 85 |
| Fast Yellow GCH | 171.50 |
| Yellow CFG Hly. Conc. | 721.00 |
| Fast Yellow GS | 126 96 |
| Fast Yellow CHRS | 116.85 |
| Viscose Orange A | 210.35 |
| Fast Orange GR | 171.50 |
| Red | 122.65 |
| Dark Tan | 98.15 |
| Red IIR | 98.15 |
| Red 4B | 217.55 |
| Bordeaux BW | 170.10 |
| Fast Scarlet 4BS | 223.50 |
| Red 12B | 220.45 |
| Bordeaux Hly. Conc. | 249.20 |
| Cotton Red N | 117.05 |
| Brill. Fast Helio B | 362.85 |
| Brill. Fast Helio 2R | 385 [illegible] |
| Brill. Fast Helio 2RS | 177.30 |
| Brill. Fast Helio BS | 116.10 |
| Brill. Violet Extra | 181.45 |
| Blue 2B | 102.50 |
| Blue G | 220.45 |
| Sky Blue FB | 242.00 |
| Copper Blue GR | 190.25 |
| Fast Greenish Blue GL | 114.60 |
| Developed Black BT | 149.95 |
| Blue NB-2B | 348.45 |
| Blue NB-2BG | 214.70 |
| Developed Black NB-GHB | 214.70 |
| Green B | 142.75 |
| Green NB-B | 218 90 |
| Green 2B-N | 218.9[illegible] |
| Brown MR | 197.40 |
| Brown CN | 137.00 |
| Golden Brown G | 175.85 |
| Catechin G | 155.70 |
| Omega Tan | 161.45 |
| Catechin GS | 102.80 |
| Black E Hly. Conc. | 180.15 |
| Black E Extra Hly. Conc. | 180.15 |
| Black NB-ER Hly. Conc. | 290.50 |
| Red 2B | 42 |
| Red FB | 42 |
| Red Violet FBL | 62 |
| Orange 3R | 25 |
| Violet 3R | 37 |
| Violet RL | 35 |
| Violet 6R | 63 |
| Scarlet RR | 28 |
| Rubine 3B | 28 |
| Rubine CB | 449 |
| Blue GL | 419 |
| Blue BGF | 805 |
| Navy Blue RE | 359 |
| Brown 3REL | 272 |
| Black GEL | 420 |
| Dark Brown 3B | 411 |

| DISPERSOL COLOURS | Per Kg. |
|---|---|
| Red B 3B Conc | 611.50 |
| Red B 2B Conc | 797.90 |
| Red CB Powder | 1048.25 |
| Red D2B Powder | 599.85 |
| Violet C 4R Conc. | 1202.70 |
| Blue BG Conc | 580.65 |
| Blue BN Powder | 128.20 |
| Blue D 2R Powder | 588 25 |
| Navy BT Conc | 531 95 |
| Blue B 2G Conc | 577 95 |
| Black BT Conc | 319 50 |
| Blue BR | 482.40 |
| Yellow 7GL | 813 20 |
| Yellow 5RX | 269 90 |
| Yellow 3G | 473 20 |
| Yellow | 140 00 |
| Yellow AL | 167.20 |
| Yellow Brown PEL | 311.70 |
| Yellow FFL | 571.40 |
| Gold Yellow GG | 320.80 |
| Pink REL | 593 00 |
| Red BEL | 615 60 |

| BASE COLOURS | Per K |
|---|---|
| Fast Yellow GC | 77. |
| Fast Orange GC | 128. |
| Fast Scarlet R | 198 |
| Fast Scarlet RC | 128. |
| Fast Scarlet RCR | 105. |
| Fast Scarlet G | 115. |
| Fast Scarlet GN | 92. |
| Fast Scarlet GG | 77.7 |
| Fast Scarlet GGS | 73. |
| Fast Red B | 233 5 |
| Fast Red RC | 115.7 |
| Fast Red R Flakes | 158.8 |
| Fast Red TR | 181 6 |
| Fast Red TR Oil | 223.3 |
| Fast Red RL | 251.20 |
| Fast Red KB Oil | 251.20 |
| Fast Bordeaux GP | 236.00 |
| Fast Garnet GBC | 103 05 |
| Fast Violet B | 548.80 |
| Fast Blue BB | 566 50 |

| NAPHTHOL COLOURS | Per Kg. |
|---|---|
| ASG | 301 85 |
| AS | 205 65 |
| ASSW | 379 10 |
| ASBS | 253.75 |
| ASBO | 266 40 |
| ASD | 209 45 |
| ASOL | 243 60 |

| | |
|---|---|
| | 369.00 |
| | 336.05 |
| | 236.00 |
| | 249.95 |
| | 2002.35 |
| | 2459.45 |
| G | 143.00 |
| | 538.65 |
| | 652.60 |

| CION COLOURS | Per Kg. |
|---|---|
| len Yellow HR | 207.95 |
| Yellow H4G | 145.65 |
| ra Yellow H-8GP | 168.55 |
| . Yellow HE6G | 214.75 |
| ow G-E4R | 276.05 |
| . Yellow H7G | 332.30 |
| ow M4R | 275.45 |
| ow MGR | 387.65 |
| . Yellow M4G | 201.15 |
| . Yellow M8G | 366.10 |
| low M3R | 244.70 |
| l. Orange H2R | 303.80 |
| l. Red H7B | 157.95 |
| ll. Orange M2R | 313.15 |
| ll. Red H8B | 213.55 |
| ll. Scarlet H RN | 245.05 |
| pra Red H-3BP | 179.80 |
| ill. Red H-F3B | 243.45 |
| ill. Magenta HB | 182.00 |
| ill Red M 5B | 160 05 |
| ill Red M 8B | 218.35 |
| ill. Pink MB | 137 10 |
| ill. Magenta MB | 163.65 |
| ill. Purple H-3R | 219.55 |
| ill. Purple H-7R | 175.40 |
| avy Blue H 3R | 333.75 |
| rill. Blue H-GR | 406.40 |
| rill. Blue H5G | 207 95 |
| lue H 5RX | 286.20 |
| rill. Blue H 7G | 213.95 |
| rill. Blue H 7RX | 358.15 |
| urquoise HA | 265.05 |
| Supra Blue H-3RP | 595.30 |
| Supra Turquoise H 2G P | 181.50 |
| Blue H-FRD | 305.80 |
| Navy Blue H3R | 333.75 |
| Blue H 5RX | 286.20 |
| Navy Blue M3R | 355.70 |
| Brill. Blue MR | 405.60 |
| Brill. Blue M RX | 214.20 |
| Brill. Blue M-G | 226.45 |
| Blue M 4GD | 369.40 |
| Navy Blue M RB | 341.85 |
| Turquoise M-G | 240.30 |
| Brill. Blue M GX | 516.25 |
| Blue 3R Acra Powder | 718.20 |
| Dark Brown H 6R | 248.45 |
| Cobalt Oxide | 285.00 |
| Green H4BD | 287.00 |
| Green H-E4BI | 169.80 |
| Red Brown H IF | 143.25 |
| Orange Brown H 28 | 209.05 |
| Brown M GRN | 188.80 |
| Black H-N | 314.20 |

| SULPHUR COLOURS | Per Kg. |
|---|---|
| Navy Blue | 210.35 |
| Green G | 194.55 |
| Black Grains Extra | 72.25 |
| Black Grains OG | 73.70 |
| Black GXE Conc. | 70.85 |
| Black GXE | 57 90 |
| Black GXR | 69.40 |
| Black Grains 800 | 62.80 |
| Black EXR Greins | 73.70 |
| Black EXR Grains 800 | 59.35 |

| VAT COLOURS (ICI) | Per Kg. |
|---|---|
| Yellow 5G Supra Disperse | 561 85 |
| Yellow 5G Acra Conc | 818 60 |
| Gold Orange 3G Pdr. Fine | 1158.45 |
| Brill. Orange 6R Pdr. Fine | 624 35 |
| Gold Orange 3G Supra Disp | 693 85 |
| Brill. Orange 6RX Powder | 394 30 |
| Brill. Red 3B Pdr. Fine | 1214 15 |
| Brill. Red 3B Supra Disp | 867 45 |
| Brill: Purple 3R Acra Powder | 827 05 |
| Brill. Purple 2R Hly Conc. | 744.25 |
| Brill. Purple 4R Supra Disp. | 804.25 |
| Brill. Purple 2R Acra Conc. | 779.85 |
| Blue 2R Powder Fine | 675.30 |
| Blue BC Acra Con Pdr. Fine | 1013.15 |
| Blue BC Conc. Pdr. Fine | 713.65 |
| Blue R Conc. Pdr. Fine | 719.70 |
| Blue Conc. Powder | 645.80 |
| Brill. Blue 2R Hly. Conc. | 378.55 |
| Blue RR Supra Powder | 629.35 |
| Brill. Blue 2R Supra Disp. | 115.65 |
| Dark Blue 2R Powder Fine | 512.65 |
| Blue BC Supra Disp. | 419.65 |
| Jade Green XBN Powder Fine | 555.80 |
| Jade Green XBN Acra Conc. Pdr | 1026.05 |
| Jade Green 2G Pdr. Fine | 533.25 |
| Jade Green 2G Ptg. Paste | 125.40 |
| Jade Green XBN Ptg. Paste | 126.00 |
| Jade Green 2G Supra Disp. | 618.00 |
| Olive D Pdr. Fine | 563.90 |
| Olive Green B Supra Disp. | 421.70 |
| Jade Green XBN Supra Disp. (N) | 327.30 |
| Olive OMW Powder Fine | 698 55 |
| Olive OMW Supra Disp. | 538.05 |
| Olive D Supra Disp. | 361.70 |
| Olive R Supra Disp. | 470.25 |
| Olive D. Ptg. Paste | 193.00 |
| Olive Green B Ptg. Paste | 199.10 |
| Olive Green B Acra Conc. | 741.10 |
| Olive R Acra Conc.. | 779 85 |
| Brown R Pdr. Fine | 869 45 |
| Dark Brown 3R Fine | 826 25 |
| Brown G Supra Disp | 582 05 |
| Brown 2G Supra Disp. | 716 10 |
| Brown R Supra Disp | 547 35 |
| Brown BR Powder | 867.75 |
| Dark Brown 3R Ptg. Paste | 217 15 |
| Dark Brown 3R Supra Disp | 529 60 |
| Brown G Acra Conc. | 967.95 |
| Brown M. Powder Fine | 768.80 |
| Grey M. Supra Disp. | 585.45 |
| Blue BC Acra Conc. Pdr. Fine | 762.70 |
| Direct Black AC Supra Disp. | 415.75 |
| Direct Black AC Pdr. Fine | 574.70 |
| Direct Black CH Supra Disp. | 190 45 |
| Direct ACD Ptg. Paste | 217 15 |

# Delhi Market

**DELHI: JULY 27, (NNS)** Citric acid recorded a rise of Rs. 50 at Rs. 1,925 (per 50 kg) in the Delhi chemicals market during last week, following fall in fresh import from China as well as encouraging advices from Bombay. In Bombay citric acid was stated at Rs. 1,875 (per 50 kg). As a result of shortage of floating stock and fall in fresh supply, citric acid Bombay Dyeing remained firm at Rs. 2,375.

In the early part of the week, on account of reduced supply, sodium nitrite Deepak jumped up sharply from Rs. 1,150 to Rs. 1,400, but at the weekend in view of improved supply, prices reacted downward and finally settled at Rs. 1,325, yet showing a rise of Rs. 175 over its last week's level. Camphor Thal hardened again by Re. 1 at Rs. 107, owing to sustained demand from the traders of northern and southern India. Rangolite Germany moved up from Rs. 82 to Rs. 83 due to paucity of supply, while chatkolite and sufolite declined by 50 paise at Rs. 54 and Rs. 56 per kg respectively, thanks to increased profit taking selling by stockists. Sodium hydro sulphite Gulshan quoted higher by 50 paise at Rs. 37.50 per kg due to improved demand.

On account of negligible supply combined with continued good demand from bakeries and halwaies, ammonia bicarb advanced further by Rs. 5 at Rs. 175 per 25 kg. Caustic soda flakes remained static at Rs. 535. Paraffin wax drifted lower by Rs. 5 at Rs. 975 owing to improved supply. Slack and match wax ruled quiet at their last week's level of Rs. 10,400 and Rs. 16,500.

Citric acid France moved up by Rs. 10 at Rs. 290 due to fall in import from France. As a result of sustained demand from plastic and paint units, titanium dioxide TTP and RC-822 quoted higher by Re. 1 at Rs. 64 and Rs. 87 per kg. K-brand titanium of Calcutta also quoted higher at Rs. 61 against Rs. 60, while menthol bold slipped by Rs. 15 at Rs. 360 thanks to increased arrivals from U.P., while menthol flake remained firm at Rs. 285, owing to increased mutual speculation. Dyes and colours did not show any variation on withdrawal of demand.

## (DELHI MARKET RATES AS ON JULY 27, 1990)

| | |
|---|---|
| Ammonia Bicarb (Per 25 Kg.) | 175.00 |
| Mercury (Per flask) | 11,000.00 |
| Soda ash (Per bag) | 360/380.00 |
| Ammonium Chloride (50 Kg.) | 120/180.00 |
| Caustic soda flakes (50 Kg.) | 535.00 |
| Citric acid (Per 50 Kg.) | 1,925/2,375.00 |
| Stable Bleaching Powder Shriram (Per 25 Kg.) | 101.00 |
| Stable Bleaching Powder KCl (Per 25 Kg.) | 90.00 |
| Stable Bleaching Powder Maruti (Per 25 Kg.) | 91.00 |
| Stable Bleaching Powder Modi (Per 25 Kg.) | 92.00 |
| Sodium Bicarbonate (50 Kg.) | 315/325.00 |
| Sodium Hydrosulphite (Per Kg.) | 37.50/40.00 |
| Rangolite (Per Kg.) | 83.00 |
| Tartaric acid France (Per Kg.) | 290.00 |
| Sufolite (Per Kg.) | 56.50 |
| Chatkolite (Per Kg.) | 54.50 |
| DMO (per Kg.) | 80.00 |
| Boric acid Technical (Per 50 Kg.) | 1,625.00 |
| Paraffin Wax (Per 50 Kg.) | 975.00 |
| Slack wax (Per metric tonne) | 10,400.00 |
| Tartaric Acid (Swastik Per Kg.) | N.A. |
| Borax Granular (Per 50 Kg.) | 800.00 |
| Borax Crystal (Per 50 Kg.) | 825.00 |
| Sodium Nitrite (Per 50 Kg.) | 1,150/1,325.00 |
| Sodium Nitrate (Per 50 Kg.) | 500.00 |
| Camphor Thal (Per Kg.) | 107.00 |
| Camphor Powder (Per Kg.) | 96.00 |
| Menthol Bold (Per Kg.) | 360.00 |
| Menthol Medium (Per Kg.) | |
| Menthol Flake (Per Kg.) | |
| Mentha Oil (Per Kg.) | |
| Glycerine (Per Kg.) | 55 |
| Sodium Silicate (Per quintal) | 300/ |
| Hexamine (Per Kg.) | |
| Acetic Acid Glacial (Per Kg.) | |
| Copper Sulphate (Per quintal) | 2,300 |
| Formic Acid (Per Kg.) | |
| Formaldehyde (Per Kg.) | |
| Hydrogen Peroxide (Per Kg.) | |
| Calcium Carbonate (Per Tonne) | |
| Acid Slurry Soft (Per Kg.) | |
| Acid Slurry Hard (Per Kg.) | |
| Phosphoric Acid (Per 50 Kg.) | 1,2 |
| Potassium Nitrate (Per quintal) | 1,000/1,2 |
| Potassium Permanganate (Per 50 Kg.) | 2,600/3,0 |
| Sodium Bichromate (Per 50 Kg.) | 1,575/1,6 |
| Trisodium Phosphate (50 Kg.) | 5 |
| Titanium Dioxide Anatase T.T.P (Per Kg.) | 6 |
| Titanium Dioxide RC-822 (Per Kg.) | 8 |
| Titanium Dioxide Anatase K-Brand (Per Kg.) | 6 |
| Titanium Dioxide RCR-2 (Per Kg.) | |
| Zinc Oxide (Per Kg.) | 46.00/5 |
| Phenol Carbolic Acid (Per Kg.) | 3 |
| Carbon Tetrachloride (Per Kg.) | 2 |
| Chloroform (Per Kg.) | 2 |
| Sodium Sulphate (Per metric tonne) | 3,400/3,900 |
| Naphthalene Balls (Per 50 Kg.) | 1,375 |

| DYES & COLOURS | (Per K |
|---|---|
| Naphthol AS | 175/211 |
| Naphthol ASG | 180/249 |
| Naphthol ASBS | 210/260 |
| Naphthol ASTR | 300/378 |
| Naphthol ASOL | 210/250 |
| Naphthol ASBO | 195/274 |

| DIRECT DYES | (Per K |
|---|---|
| Black E. Conc. | 120/185. |
| Diazo Black B.T. | 105/154. |
| Green B | 90/147. |
| Blue 2-B | 60/107. |
| Blue 2-B 225% (JNR) | 125. |
| Sky Blue FB | 160/248. |
| Basic Auramine | 55/110. |
| Basic Rhodamine | 300/425. |
| Basic Methylene Blue | 100/180. |
| Basic Violet | 165/210. |
| Basic Malachite Green | 175. |
| Acid Orange | 75/111.2 |
| Congo Red H/C | 75/120.9 |

# Madras Market

arkets were subdued with ing to prop up the prices. Sali- feature of the week is Manali ochemicals commencing com- cial production at their unit at lras which will be producing pro- ne glycol and polyols. The prin- al consuming sectors i.e. handlooms and leather finishing are poised for greater exports with increased thrusts from Government and are expected to do well. This is hardly reflected in the chemical market and it is expected that the consumption will go up in the coming months.

## (MADRAS MARKET RATES AS ON JULY 28, 1990)

| | |
|---|---|
| ic Acid Glacial (per kg) | 14.50 |
| ninium Sulphate Iron free er MT) | 3,500.00 |
| nonium Bicarbonate er 25 kgs) | 150.00 |
| nonium Chloride (per MT) | 2,100.00 |
| Slurry (per kg) | 30.50 |
| um Carbonate (per kg) | 11.00 |
| um Chloride (per kg) | 10.00 |
| c Acid Technical (per kg) | 28.00 |
| aching Powder (per 50 kgs) | 220.00 |
| ax (per 50 kgs) | 785.00 |
| istic Soda Flakes -- Mettur hemicals (per MT) | 11,500.00 |
| istic Soda Flakes -- Andhra ugars (per MT) | 11,500.00 |
| cium Chloride 70% Solid per MT) | 3,500.00 |
| cium Chloride Anhydrous per MT) | 6,000.00 |
| cium Carbonate (Activated) per MT) | 6,500.00 |
| Calcium Carbonate (Precipitated) (per MT) | 5,500.00 |
| Citric Acid (per kg) | 48.00 |
| Copper Sulphate (per kg) | 22.00 |
| Cresylic Acid 98-99% (per kg) | 130.00 |
| Pure Para Cresol 96% (per kg) | 86.00 |
| Meta Para Cresol 42% (per kg) | 50.00 |
| Formic Acid (per kg) | 27.00 |
| Formaldehyde (per kg) | 8.00 |
| Glue Flakes (per kg) | 15.00 |
| Glycerine I.W. (per kg) | 50.00 |
| Hydrosulphite of Soda (TCPL) (per kg) | 38.00 |
| Hydrosulphite of Soda (IDI) (per kg) | 42.00 |
| Hydrosulphite of Soda (BASF) (per kg) | 41.00 |
| Hexamine (per kg) | 31.00 |
| Hyflosupercell (per kg) | 22.00 |
| Hydrogen Peroxide (per kg) | 32.00 |
| Litharge (per kg) | 38.00 |
| Lead Acetate (per kg) | 38.00 |
| Magnesium Carbonate (per kg) | 18.00 |
| Magnesium Chloride (per kg) | 3.75 |
| Maleic Anhydride (per kg) | 40.00 |
| Menthol Crystals (per kg) | 325.00 |
| Oxalic Acid (per kg) | 18.00 |
| Paraffin Wax (per kg) | 18.00 |
| Potassium Bichromate (per kg) | 38.00 |
| Phosphoric Acid (per kg) | 27.50 |
| Polyvinyl Alcohol Powder (per kg) | 150.00 |
| Pentaerythritol (per kg) | 52.00 |
| Phthalic Anhydride (per kg) | 30.00 |
| Soda Ash (TAC) (per 75 kgs) | 410.00 |
| Soda Ash (TATA) (per 75 kgs) | 410.00 |
| Sodium Bicarbonate (TATA) (per 50 kgs) | 385.00 |
| Sodium Silicate (per MT) | 3,750.00 |
| Sodium Bichromate (per kg) | 26.00 |
| Sodium Nitrate (per kg) | 8.00 |
| Sodium Nitrite (per kg) | 26.00 |
| Sodium Sulphide Flakes (per kg) | 14.00 |
| Sodium Bisulphite (per kg) | 8.50 |
| Sodium Alginate (per kg) | 290.00 |
| Sodium Acetate (per kg) | 7.00 |
| Sodium Sulphate (Anhydrous) (per kg) | 3.75 |
| Titanium Dioxide (Anatase) (per kg) | 62.00 |
| Titanium Dioxide (Rutile) (per kg) | 80.00 |
| Trisodium Phosphate (per kg) | 10.00 |
| Urea (Technical) (per kg) | 3.00 |
| Zinc Oxide (per kg) | 50.00 |
| Zinc Chloride Powder (per kg) | 14.00 |
| Zinc Sulphate (per kg) | 8.00 |

### SOLVENTS

| | |
|---|---|
| Acetone -- HOCL (per kg) | 18.75 |
| Butanol (per kg) | 35.00 |
| Butyl Acetate (per kg) | 40.00 |
| Benzene (per lit) | 14.00 |
| Cellosolve (per kg) | 62.00 |
| Carbon Tetra Chloride (per kg) | 23.00 |
| Chloroform (per kg) | 29.00 |
| Diacetone Alcohol (per kg) | 30.00 |
| Diethylene Glycol (per kg) | 30.00 |
| Dichloroethane (per kg) | 18.00 |
| Di-octyl Phthalate (per kg) | 46.00 |
| Dj-N-butyl Phthalate (per kg) | 46.00 |
| Ethyl Acetate (per kg) | 17.00 |
| Isopropyl Alcohol (per kg) | 28.75 |
| Methanol (per kg) | 10.00 |
| Methylene Chloride (per kg) | 22.00 |
| Methyl Ethyl Ketone (per kg) | 30.00 |
| Methyl Isobutyl Ketone (per kg) | 41.25 |
| Phenol (per kg) | 38.00 |
| Sorbitol (per kg) | 15.00 |
| Triethanolamine (per kg) | 93.00 |
| Trichloroethylene (per kg) | 27.00 |
| 1-1-1 Trichloroethane (per kg) | 29.00 |
| Turpentine (per lit) | 16.00 |
| Toluene (per lit) | 14.00 |
| Xylene (per lit) | 25.00 |

# International Bulk Chemical Prices

## SPOT PRICES AS ON 11th JULY 1990

| Product | European Spot Price range ($/ton) | US Price Range ($/ton) |
|---|---|---|
| Ethylene (delivered) | 600-730 (cif) | 507 |
| Propylene | 395-455 (cif) | 341-386 (spot) |
| Butadiene | 480-500 (fob) | 595 |
| Benzene | 365-375 (fob) | 369-375 (spot) |
| Toluene | 325-330 (fob) | 334 (spot) |
| Xylenes (virgin) | 305-310 (fob) | 300-310 (spot) |
| (solvent) | 305-310 (fob) | n.a. |
| Styrene | 1050-1100 (T2) (fob) | 1100-1255 (spot) |
| | 1050-1100 (T1) (cif) | |
| Paraxylene | 365-370 (fob) | n.a. |
| Orthoxylene | 368-372 (fob) | n.a. |
| Ammonia | 115-127 (cif) | n.a. |
| Methanol | 123-125 (T2) (fob) | n.a. |
| | 102-104 (T1) (cif) | |
| Naphtha | 147-149 (cif) | |

# Shipping News

## VESSELS DUE IN BOMBAY FOR EXPORT LOADING

| Due Date (1) | Steamer's Name & Flag (2) | Agents (3) | Will load for (4) | Appr sailing (5) |
|---|---|---|---|---|
| 9/8 | Vishva Parijat (Ind) | S.C.I. | New York, Baltimore; Savannah; Norfolk; Charleston; Houston; Jacksonville; New Orleans; Boston; P. Everglade. (Carting at T.P. No. 1). | 13/8 |
| 4/8 | Lanka Aruna | Seahorse | New York; Baltimore; Charleston; Norfolk. (Carting at M.O.D. No. 3). | 8/8 |
| 7/8<br>12/8 | CMB Mallet/<br>CMB Mover (Nhava Sheva) | C.M.B. | Norfolk; New York; Baltimore; Philadelphia; Charleston; Savannah; Houston; Miami; New Orleans via Antwerp; Montreal; Toronto; Halifax. (Carting at Kalamboli). | 9/8<br>14/8 |
| 1/8 | Horch Clipper (Bahama) | Patvolk | Montreal & Toronto via Halifax; New York; Boston; Norfolk; Charleston; Houston; Savannah; Wilmington; Philadelphia; Baltimore; New Orleans; & FCL Chicago; Milwaukee; Atlanta; Dallas. (Carting at H.B. No. 5). | 9/8 |
| 4/8 | Seacrest Achiever (Voy-218) | Patvolk/P&O/ S.W.& Co./ | S. American Ports. (Carting at T.P. No. 4 for P & O, S.W. & Co. & Trident) (Carting at Hay Bunder No. 4 for Patvolk). | 9/8 |
| | | Trident/ | New York; Norfolk; Savannah; Baltimore; Boston; Charleston; Houston. | |
| | | Seaspeed/ | New York; Baltimore; Norfolk; Savannah; Charleston; Houston; & South American ports. (Carting at M-178 Cotton Depot). | |
| | | M.C.S./ | Savannah; New York; Baltimore; Wilmington; Houston; Galveston; Los Angeles; Longbeach; Boston; Norfolk; Charleston; Jacksonville; Miami; Tempa; New Orleans; Providence; San Diego; Oakland; San Francisco; Stockton; Chicago; Detroit; Cleveland; Milwaukee; Columbus; Kansas City; Atlanta; Nashville; Dallas; Minneapolis. (Carting at E-Grain Depot). | |
| | | Ranadip | New York; (Elisabeth); Portsmouth (Norfolk); Baltimore; Charleton; Boston; Philadelphia; Houston; New Orleans; Jacksonville; Savannah; Wilmington (N.C.); Mobile; P. Everglades; (Miami); Los Angeles; (Longbeach); Oakland; Portland; Seattle; Anchorage; Montreal; Qubec; Ontario; Toronto Via Halifax; Vancouver; Detroit Also Caribbean and Mexican Ports. (Carting at M.O.D. No. 3). | |
| 6/8 | Ever Bridge (Voy-035) | Greenways | New York; Newark; Baltimore; Charleston; New Orleans; Houston; Boston; Providence; (RI); Philadelphia; Norfolk; Savannah; | 11/8 |

| (2) | (3) | (4) | (5) |
|---|---|---|---|
| | | Jacksonville; Wilmington; Miami; Montreal; Toronto; Bermuda; Los Angeles; Longbeach; San Francisco; Oakland; San Diego; Stockton; Richmond; Almeida; Redwood City; Sacramento; Seattle; Portland; Vancouver (B.C.); Tacoma; Longview; Chicago; Dallas; Various inland destinations and Caribbean ports. (Carting at G/H Cotton Depot). | |
| CMB Mallet/<br>CMB Mover<br>(Nhava Sheva) | C.M.B. | Lagos; Abidjan; Lome; Douala; Matadi; Port Gentil; Pointe Noire; Nouakchott; Cotonou; Dakar; Luanda; Monrovia; Tema via Antwerp. (Carting at Kalamboli). | 9/8<br>14/8 |
| Seacrest Achiever | Patvolk/P&O/<br>S.W. & Co. | West African Ports. (Carting at T.P. No. 4 for P&O and S.W. & Co.). (Carting at Hay Bunder No. 4 for Patvolk). | 9/8 |
| | Seaspeed/ | West African Ports. (Carting at M-178 Cotton Depot). | |
| Vishva Parijat (Ind) | S.C.I. | P. Said; Felixstowe; Hamburg; Rotterdam; Antwerp; Bremen; Liverpool; Manchester; Avonmouth; London; Belfast; Aarhus; Oslo; Helsinki; Copenhagen; Gothenburg & all inland destinations. (Carting at T.P. No. 1) | 13/8 |
| Lanka Aruna (Phi) | Seahorse | Felixstowe; London; Liverpool; Manchester; Avonmouth; Dublin; Glasgow; Wembly; Leicester; Immingham; Birmingham; Leeds; Antwerp; Bremen; Copenhagen; Gothenburg; Hamburg; Rotterdam; Oslo; Stockholm; Helsinki; Aarhus; Malmao; Norkopping. (Carting at M.O.D. no. 3). | 8/8 |
| CMB Mallet/<br>CMB Mover<br>(Nhava Sheva) | C.M.B./<br>Merzario | Port Sudan; Jeddah; La Spezia; Valencia; Genoa; Bacelona; Marseilles; Tunis; Casablanca; Tangier; Alexandria; Piraeus; Mersin; Limassol; Felixstowe; London; Liverpool; Manchester; Birmingham; Avonmouth; Dublin and all inland destinations in U.K.; Antwerp; Rotterdam; Hamburg; Bremen; Leixoes; Lisbon; Copenhagen; Oslo; Gothenburg; Stockholm; Malmao; Aarhus; Helsinki. (Carting at Kalamboli for both). | 9/8<br>14/8 |
| Berezovka (Rus) | Transocean | Aden; P. Sudan; Istanbul; Jeddah; Odessa. | 15/8 |
| Seacrest Achiever (Ger)(V-218) | Merzario/ | Jeddah; Hodeidah; P. Sudan; Ravenna; Ancona; Piraeus; Venice; Trieste. (Carting at M.O.D. No. 2). | 9/8 |
| | Seaspeed/ | Tilbury; London; Felixstowe; Manchester; Liverpool; Avonmouth; Le Havre; Rotterdam; Hamburg; Antwerp; Bremerhaven and Scandinavian Ports. (Carting at M-178 Cotton Depot). | |
| | S.W. & Co./<br>Trident/<br>P&O | Tilbury; London; Felixstowe; Avonmouth; Manchester; Liverpool; Glasgow; Leeds; Birmingham; Dublin; Belfast; Bristol; Marseilles; Genoa; Barcelona; Le Havre; Antwerp; Rotterdam; Hamburg; Bremerhaven; Copenhagen; Oslo; Helsinki; Malmao; Gothenburg; Stockholm; Aarhus; Álborg. (Carting at Timber Pond No. 4 for S.W. & Co., Trident and P&O). | |
| | Patvolk | U.K.; N. Continent and Med. Ports. (Carting at Hay Bunder No. 4). | |
| Ever Bridge (V-035) (Pan) | Greenways | Hamburg; Felixstowe; Rotterdam; Antwerp; Le Havre; London; Liverpool; Leixoes; Lisbon; Manchester; Avonmouth; Wembly; Birmingham; Leeds; Leicester; Amsterdam; Bremen; Copenhagen; Aarhus; Gothenburg; Oslo; Stockholm; Helsinki; Belfast & all destinations in U.K.; Germany; Switzerland and Austria. (Carting at G/H Cotton Depot). | 11/8 |
| Volosko (Yug) | Oceanic | Jeddah; P. Said; Rijeka. | 16/8 |
| Yulius Fuchik (Rus) (V-III W/B) | Transocean | Odessa; Izmail; Reni (U.S.S.R.); Russe; Bulgaria; Budapest (Hungary); Vienna (Austria); Bratislava (Czechoslovakia); Deggendorff; Regensborg (West Germany). (All ports on River Danube). (Carting at N/O-PD & G-PD). | 16/8 |
| Lanka Aruna | Seahorse | Colombo. (Carting at M.O.D. No. 3). | 8/8 |
| Samudra Samrat | J.M. Baxi | Karachi (Afghanistan); Chittagong. | 14/8 |
| Lanka Aruna | Seahorse | Singapore; Penang; P. Kelang; Bangkok; Hongkong; Keelung; Kobe; Yokohama & FCL only Busan; Inchon; Osaka; Tokyo; Nagoya; Kaohsiung. (Carting at M.O.D. No. 4). | 8/8 |
| Zinoviv Solovyev | Transocean | Singapore; Main Japan Ports. | 14/8 |
| Ever Bridge (V-035) (Pan) | Greenways | Singapore; Penang; Port Kelang; Bangkok; Djakarta; Surabaya; Manila; Cebu; Kaohsiung; Keelung; Osaka; Yokohama; Kobe; Shimizu; Moji; Nagoya; Busan; Hongkong. (Carting at G/H Cotton Depot). | 11/8 |
| Lanka Aruna | Seahorse<br>/ | Brisbane; Femantle; Sydney; Melbourne; Adelaide. (Carting at M.O.D. No. 3). | 8/8 |
| CMB Mover (Nhava Sheva) | CMB/<br>Merzario | Dubai, Abu Dhabi; Bahrain; Kuwait; Dammam; Doha. (Carting at Kalamboli for both). | 14/8 |

| (1) | (2) | (3) | (4) | (5 |
|---|---|---|---|---|
| 4/8 | Seacrest Achiever (Voy-218) | Penguin/ | Dubai; Abu Dhabi; Sharjah; Doha; Muscat; Jebel Ali; Kuwait; Bahrain; (Carting at H.B. No. 4). | 9/ |
| | | Merzario/ | Dubai; Sharjah; Abu Dhabi; Muscat; Doha; Dammam; Kuwait; Bahrain. (Carting at M.O.D. No. 2). | |
| | | L. Triest/ | Dubai; Dammam; Riyadh; Muscat; Abu Dhabi; Doha; Kuwait; Bahrain. (Carting at M-171/173 Cotton Depot). | |
| | | O.S.A./ | Dubai; Abu Dhabi; Bahrain; Doha; Muscat; Kuwait; Dammam. (Carting at M-178/180 Cotton Depot). | |
| | | Seaspeed/ | Dubai; Dammam; Bahrain; Kuwait; Doha. (Carting at M-178 C.D.). | |
| | | Kanika/ | Dubai; Abu Dhabi; Sharjah; Muscat; Kuwait; Bahrain. (Carting at T.P. No. 3). | |
| | | Parekh | Muscat; Dubai; Sharjah; Abu Dhabi; Basrah; Baghdad; Mosul. (Carting at Timber Pond No. 3). | |
| 12/8 | CMB Mover (Nhava Sheva) | C.M.B. | Dar Es Salaam; Mombasa (Direct); Nacala; Tanga; Kampala; Blantyre; Lusaka; Ndola; Matwara; Lilongwe & all inland destinations in East Africa. (Carting at Kalamboli). | 14/ |

## VESSELS DUE FOR IMPORT DISCHARGE

| Due Date | Steamer's Name | Agents | From |
|---|---|---|---|
| 10/8 | Mostween 5 | Sai Ship | U.K. Cont. |
| 15/8 | Putvil | Transocean | Far East |
| 8/8 | Samudra Samrat | J.M. Baxi | Rangoon |
| 8/8 | Silver Chariot | J.M. Baxi | Cont. |
| 9/8 | Vishva Parijat | S.C.I. | U.K. Cont/U.S. |
| 22/8 | Vishva Parag | S.C.I. | U.K. Cont. |
| 19/8 | Vishva Prafulla | S.C.I. | U.K. Cont. |
| 15/8 | Yulius Fuchik (V-111) | Transocean | Russia/E. Europe |

IMPORTED ANALYTICAL INSTRUMENTS
AVAILABLE EX-STOCK

1. SHIMADZU UV-VIS SPECTROPHOTOMETER
2. SHIMADZU HPLC SYSTEMS
3. BROOKFIELD VISCOMETER DIGITAL & DIAL READOUT
4. PERKIN ELMER GAS CHROMATOGRAPH MODEL - 8700
5. PERKIN ELMER FTIR SPECTROPHOTOMETER

Contact: Mr. N.K. Darji

M.J. EXPORTS LTD.

113, Jolly Maker Chambers No. 2, Nariman Point, Bombay - 400 021.
Phone: 2020644 (7 lines) * Fax: (22) 2048030
Cable: SYNEXPORT
Telex: 11-4677 MJAY IN * 11-2478 MJAY IN * 11-4810 MJAY IN

# Materials Imported/Exported

## MATERIALS IMPORTED BOMBAY (From 30.4.90 to 3.5.90)

ontinued from previous issue)

IVALOYL CHLORIDE: From nce: Abdullabhai Abdulkader, 2160 s., Rs. 1,69,419.

OLYSTYROL: From Korea: BASF ia Ltd., 800 Kgs., Rs. 15,644.

HOSPHORYL CHLORIDE: From xico: Jain Industries, 1879 Kgs., 4,327.

ROPYLENE GLYCOL: From A: Asian Paints India Ltd., 17.200 s., Rs. 2,70,148.

ROPYLENE GLYCOL TECH: om Japan: Crystic Resins Pvt. Ltd., ,170 Kgs., Rs. 2,73,724.

SILICON DIOXIDE: From USA: N. vind & Company, 8,640 Lbs., . 1,97,430.

SODIUM LAURYL SULPHATE: om FRG: The Premier Automobiles d., 11,000 Kgs., Rs. 3,89,912.

SODIUM MONOFLUORO PHOS-IATE (USP): From USA: Nirma emical Works, 500 Kgs., Rs. 37,084.

STANNOUS OCTOATE: From vitzerland: Bharat Petrofoam Co. Pvt. d., 600 Kgs., Rs. 1,00,520.

STYRENE MONOMER: From etherlands: M. Champak & Co., ,600 Kgs., Rs. 3,53,218.

THIOGLYCOLIC ACID: From RG: Lakme Limited, 1,000 Kgs., s. 67,096.

THIOUREA: From Japan: Henkel hemicals India Ltd., 2,000 Kgs., s. 67,110; Sudarshan Chemicals Inds. td., 1,000 Kgs., Rs. 37,520.

TITANIUM DIOXIDE: From ustralia: Goodlass Nerolac Paints Ltd., ,00,000 Kgs., Rs. 42,75,595; From hina: Mihir Chemicals, 35 Mts., s. 7,94,736; Synpro Industries, 5 Mts., Rs. 1,48,337; Vanaprabha Esters & Glycerides, 7,000 Kgs., Rs. 2,07,672; From FRG: Ester Industries Ltd., 17,500 Kgs., Rs. 8,67,325; Popular Chemical Co., 13,500 Kgs., Rs. 4,21,452; From USA: C.J. Plastics Pvt. Ltd., 15 Mts., Rs. 6,80,605.

TRIETHYLENE GLYCOL: From Japan: Jadavji and Co., 4,050 Mts., Rs. 91,824.

TRIMETHYL PHOSPHITE: From USA: Vantech Pesticides Ltd., 31,026 Kgs., Rs. 12,99,478

TRIARYL PHOSPHATE: From USA: Maharashtra Electrosmelt Ltd., 2,085 Ltrs., Rs. 1,21,107.

## DYES MATERIALS IMPORTED BOMBAY (From 17.4.90 to 30.4.90)

C.I. SOLVENT BLACK 45: From Germany: Saba Tanning Chemicals, 350 Kgs., Rs. 83,616.

DYESTUFFS: From Switzerland: Quinn India Ltd., 50 Kgs., Rs. 53,107; From France: Shripet Inds. Pvt. Ltd., 100 Kgs., Rs. 20,492; From FRG: Tata Exports, 300 Kgs., Rs. 1,07,741.

## MATERIALS EXPORTED BOMBAY (From 7.2.90 to 8.2.90)

ACETOACET m. XYLIDINE: To Felixstowe: Colour Chem Ltd., 6,720 Kgs., Rs. 5,96,146.

4,4 DINITRO STILBENE: To Felixstowe: Sharda Intl., 5,400 Kgs., Rs. 2,78,783.

2-HYDROXY STEARIC ACID: To Barcelona: Jayant Oil Mills, 30 Mts., Rs. 7,03,829.

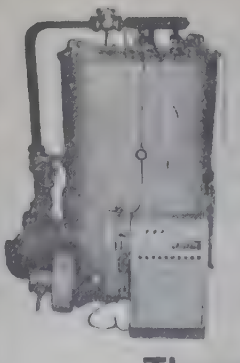
MENTHA OIL: To Singapore: Everest Flavours & Fragrances, 5400 Kgs., Rs. 6,77,447.

MENTHANE 97%: To Marseilles:

Thermomet

Fuel Saving Steam Boilers

Range Covers upto 1000 Kgs/hrs in Non-IBR Design.



- Efficiency-guaranteed 87%
- Life long after sales service.

Also offers:-

- Oil fired thermic fluid heater upto 10,00,000 K. Cals/hr.
- Hot Water Boilers Oil/Coal
- Electrode Boilers.
- Vertical/Horizontal Manual Oil/Coal/Husk Wood fired Boilers upto 1000 Kgs/hr.
- Waste heat recovery Boiler

Agarwal 'Ad'

Thermopac BOILERS

1. Dharam Palace,Shantivan, Near National Park, Borivli (E)
Bombay-400 066. Tel 664041

Mentha & Allied Pvt. Ltd., 1,080 Kgs., Rs. 1,97,000.

METANILIC ACID POWDER: To Crenoa: Sadhana Nitro Chem, 14,000 Kgs., Rs. 69,743.

METANITROBENZENE SOD. SULPHONATE: To Barcelona: Jeevan Products, 14,000 Kgs., Rs. 4,73,267.

METHYL PARATHION: To Bangkok: 18,000 Kgs., Rs. 1,56,960.

2-NAPHTHYLAMINE: To Busan: Sunbeam Monochem Pvt. Ltd., 7487.2 Kgs., Rs. 56,780.

PHENYL MERCURY ACETATE: To Barcelona: United Phosphorus, 1,000 Kgs., Rs. 1,68,243.

1:4 SULFO PHENYL 3-CARBOXY 5 PYRAZOLONE: To Osaka: Priya Chemicals, 2259.5 Kgs., Rs. 2,66,042.55.

SULFO TOBIAS ACID: To New York: Monarch Dyestuff Inds., 7,585 Kgs., Rs. 5,02,128.

VINYL SULPHONE ACETANILIDE: To Busan: Sunbeam Monochem, 31.5 Kgs., Rs. 5,26,911.

VINYL SULFONE ESTER: To Jakarta: Metro Chem Industries, 15,907 Kgs., Rs. 14,62,979.

---

## PLASTIC MATERIALS IMPORTED
## BOMBAY
### (From 30.4.90 to 3.5.90)

HDPE: From FRG: Esel packaging Ltd., 15.500 Mts., Rs. 3,78,178; The Premier Automobiles Ltd., 60 Mts., Rs. 7,80,078; From Japan: Jhaveri Polymers Pvt. Ltd., 50 Mts., Rs. 8,41,835; From Korea: Neo Sack Ltd., 20 Mts., Rs. 3,08,190; Omniplast (Bombay) Pvt Ltd., 170 Mts., Rs. 25,91,004; Plastotex Bombay Pvt. Ltd., 100 Mts., Rs. 15,24,120; From Mexico: Jai Industries, 43.875 Kgs., Rs. 6,20,603; From Saudi Arabia: Radhika Enterprises, 33 Mts., Rs. 4,95,271; Safari Industries India Ltd., 68.600 Mts., Rs. 10,77,448; From Singapore: B.S.G. Inds., 34 Mts Rs. 5,53,656; From Sweden: EP Industries Pvt. Ltd., 17,000 Kgs Rs. 3,40,333; From USA: Ananth Harivallabhavdas, 42.500 Mts. Rs. 4,52,556; Beevees Associates, 3 Mts., Rs. 4,60,734; Neo Sack Ltd., 10 Mts., Rs. 13,78,932; From Yugoslavia Financial Services, 40 Mts. Rs. 7,07,427.

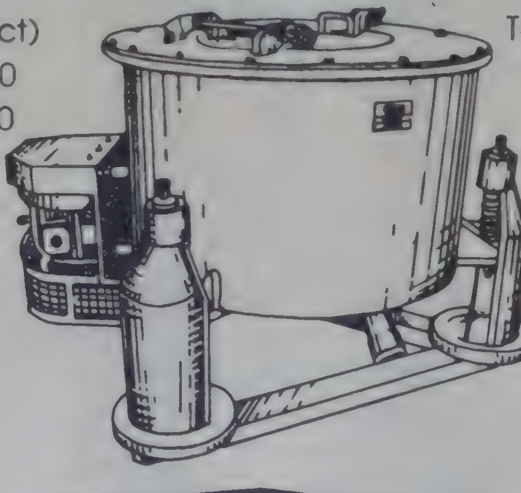
LDPE: From Netherlands: Ecoplas Pvt. Ltd., 45 Mts., Rs. 7,05,471.

POLYACETAL RESINS: From Japan: K. Raheja Exports Pvt. Ltd., 17 Mts., Rs. 6,23,015; From USA: Jamnadas Muralidhar Jaisingh, 16 Mts., Rs. 6,42,212.

POLYPROPYLENE: From Australia: Gujarat Propack Ltd., 96 Mts., Rs. 14,91,048; From Belgium: Manoj Surgical Ind. Pvt. Ltd., 15,000 Kgs., Rs. 2,72,241; From Canada: 105 Mts., Rs. 14,10,946; Gujarat Filaments Ltd., 15 Mts., Rs. 2,19,888; Harkeb Holdings Pvt. Ltd., 30 Mts., Rs. 4,39,776; K. Raheja Mercantile Corpn., 90 Mts., Rs. 12,01,530; From FRG: The Premier Automobiles Ltd., 196.25 Mts., Rs. 29,59,451; From Japan: Subham Polymers Ltd., 45 Mts., Rs. 6,29,978; From USA: Columbia Leasing & Finance Ltd., 16.650 Mts., Rs. 2,26,811; Garware Wall Ropes Ltd., 210 Mts., Rs. 27,85,244; Gayatri Plastic Inds., 16.650 Mts., Rs. 2,26,811; Liberty Traders, 136 Mts., Rs. 16,61,376; Perfect Plastics Inds., 33.3 Mts., Rs. 4,56,414; Yogi Plastic Inds., 50 Mts., Rs. 6,65,479; From Mexico: Jai Industries, 12 Mts., Rs. 2,98,827.

PTFE: From Japan: S.N. Enterprises, 1,000 Kgs., Rs. 2,61,772.

PVC: From Brazil: D.S. Kothari (P) Ltd., 600 Mts., Rs. 72,37,664; From Romania: Tirupati Intl., 75 Mts., Rs. 7,55,339; From Australia: Willard India Ltd., 18 Mts., Rs. 4,72,112; From Brazil: Maruti Shoes & Allied Inds., 100 Mts., Rs. 11,76,769; From Korea: Accurate Pipes & Plastics Pvt. Ltd., 200 Mts., Rs. 23,76,444.



Tele :-(Fact)
87 11 80
87 12 80

Tele :-(Resi)
78 392
78 330

**CHEMTEX**
ENGINEERING ENTERPRISES
Mfrs. Of : ● DRYERS ● CENTRIFUGES
● BABY BOILERS ● REACTION VESSELS
Plot No : 277 - 278 Opp. L-1 Shed
G. I. D. C. Ind. Estate, ODHAV - 382 415 (AHMEDABAD)

om Korea: Premier Vinyl Flooring d., 100 Mts., Rs. 11,74,539; Uniplas dia Ltd., 200 Mts., Rs. 24,91,850; om Mexico: Jai Industries, 58.5 Mts., s. 6,76,032; Roto Screen Tech Pvt. d., 52 Mts., Rs. 8,91,726; From Saudi rabia: Premier Vinyl Flooring, 100 ts., Rs. 11,74,539.

## RUGS MATERIALS IMPORTED BOMBAY

(From 30.4.90 to 3.5.90)

PROPYLENE GLYCOL USP: From apan: Raptakos Brett & Co. Ltd., 2.340 Mts., Rs. 5,50,268; From USA: ranco-Indian Pharmaceuticals, 6.450 ts., Rs. 1,08,735; Wardex Pharmaeuticals Ltd., 5.375 Mts., Rs. 90,612; . Uttamlal Exports Ltd., 5,375 Kgs., s. 90,612.

## DRUG MATERIALS IMPORTED BOMBAY

(7.5.90)

CLOTRIMOXAZOLE USP XXI: From Italy: Glenmark Pharmaceuticals, 250 Kgs., Rs. 2,35,042.

FURAZOLIDONE NE: From Hungary: Ventry Chemicals Pvt. Ltd., 2,000 Kgs., Rs. 2,75,064.

D-PANTHENOL USP: From Japan: Crystal Pharma, 250 Kgs., Rs. 66,316; Suithai Syn. & Chemicals, 100 Kgs., Rs. 31,030.

PHENYL PROPANOLAMINE HCL USP/BP: From Japan: Bangalore Pharma & Research Labs., 200 Kgs., Rs. 76,233.

PROPYLENE GLYCOL USP: From Japan: Raptakos Brett & Co., 16 Mts., Rs. 2,76,545.

PROPYLENE GLYCOL USP/IP: Pfizer Ltd., 16.77 Mts., Rs. 3,02,716.

SULPHADOXINE BP 80: From China: Dilipkumar & Co., 100 Kgs., Rs. 1,10,885.

SULPHATHIAZOLE BASE USSR: From USSR: J.R. Sharma & Co. Pvt. Ltd., 1,900 Kgs., Rs. 1,92,178.

## PLASTICS MATERIALS IMPORTED MADRAS

(From 17.4.90 to 30.4.90)

EPOXY RESIN: From Japan: KCP Ltd., 2,000 Kgs., Rs. 1,39,812.

HDPE: From GDR: Indo National Ltd., 17.15 Mts., Rs. 2,70,859; From Japan: Digvijay Polytex Pvt. Ltd., 20,000 Kgs., Rs. 3,39,544; Pee Yel Cee Polysacks, 10,000 Kgs., Rs. 1,71,142; Sun Polysacks Pvt. Ltd., 20 Mts., Rs. 3,39,687; Super Polytex, 20 Mts., Rs. 3,39,548; From Korea: Anand Plastics, 20,000 Kgs., Rs. 3,14,730; Asian Bags Ltd., 32 Mts., Rs. 5,20,476; Cochin Polypack Pvt. Ltd., 16 Mts., Rs. 2,64,010; Hyderabad Polymers, 48,000 Kgs., Rs. 7,92,030; Nartan Polymers Pvt. Ltd., 15 Mts., Rs. 2,36,921; Plasweave Pvt. Ltd., 16 Mts., Rs. 2,60,617; Peeyelcee Polysacks, 16,000 Kgs., Rs. 2,62,569; Polyspin Pvt. Ltd., 16,000 Kgs., Rs. 2,60,361; R.N. Polysacks, 32,000 Kgs., Rs. 5,24,574; Reliance Plastics Pvt. Ltd., 32 Mts., Rs. 5,24,095; STC of India Ltd., 4,000 Kgs., Rs. 62,946; S.S. Laminates Pvt. Ltd., 16,000 Kgs., Rs. 2,60,890; Safeguard Pkg. Systems, 64 Mts., Rs. 10,52,156; Sakthiverji Poly Pack., 32,000 Kgs., Rs. 5,24,625; Sri Bharvathi Knittings, 40,000 Kgs., Rs. 6,29,458; Sumitra Plastic Ltd., 1,91,200 Kgs., Rs. 21,12,862; Sun Polysacks Pvt. Ltd., 16 Mts., Rs. 2,63,981; Surya Filaments, 15 Mts., Rs. 2,36,634; T.S.P. Associates, 16,000 Kgs., Rs. 2,62,598; From Saudi Arabia: Excelsior Plastics, 17,150 Kgs., Rs. 2,93,306; Sam Plastics & Films, 17,150 Kgs., Rs. 2,82,831; From UAE: Earnest Decopack Inds. Pvt. Ltd., 17.15 Kgs., Rs. 2,93,306.

LDPE: From Singapore: Indo National Ltd., 16 Mts., Rs. 2,67,252; Optima Packaging Ltd., 300 Kgs., Rs. 17,793.

For Your Regular Requirements Of:

PHENOL

Please Contact

SONKAMAL ENTERPRISES

9, Khimji Meghji House, 11/15, Issaji Street,
Vadgadi, Bombay 400 003.

Phones: Office: 330352/344797 Resi.: 6367846

POLYCARBONATE GRANULAR: From Netherlands: Power Control & Appliances Co., 5000 Kgs., Rs. 3,05,400.

POLYETHYLENE: From Korea: R.N. Polysacks Pvt. Ltd., 16,000 Kgs., Rs. 2,62,287; From Netherlands: Azees Complex, 8.5 Mts., Rs. 1,27,570. From Netherlands: MDS Traders, 61.25 Mts., Rs. 9,19,254.

POLYETHYLENE GRANULAR: From Netherlands: Reddy Exports, 87.5 Mts., Rs. 13,13,220; MDS Traders, 110 Mts., Rs. 16,80,922.

POLYETHER POLYOL: From USA: U. Foam Pvt. Ltd., 16,380 Kgs., Rs. 3,11,981.

POLYPROPYLENE: From Belgium: Trans Plastics India Ltd., 15 Mts., Rs. 2,44,756; Ultramarine & Pigments, 25 Mts., Rs. 3,70,673; From FRG: Shri Narasimha Plastics, 93 Mts., Rs. 13,47,985; From Japan: Chakra Circular Sacks, 31,000 Kgs., Rs. 4,67,332; From Italy; Kunal Engg. Co. Ltd., 30 Mts., Rs. 4,26,688; From Netherlands: Polyspin Pvt. Ltd., 46.5 Mts., Rs. 6,71,243; From Singapore: Hindustan Plastics Pvt. Ltd., 16 Mts., Rs. 2,59,677; Thangam Industries, 16 Mts., Rs. 2,54,092; From USA: Bee Jay Pee Sacks Pvt. Ltd., 48,987 Kgs., Rs. 7,22,384; Bharath Trading Corpn., 16.5 Mts., Rs. 2,33,884; TVS Whirlpool Ltd., 1.25 Mts., Rs. 34,331.

POLYPROPYLENE HOMOPOLYMER: From China: Ultramarine & Pigments Ltd., 14.5 Mts., Rs. 2,06,232.

POLYPROPYLENE RESIN: From Japan: Chola Packaging Pvt. Ltd., 30 Mts., Rs. 4,43,735; Polyspin Pvt. Ltd., 30 Mts., Rs. 4,43,558; Sri Narsimha Plastics Inds., 60 Mts., Rs. 8,73,879.

PVC RESIN: From Yugoslavia: Asian Accumlator, 10.2 Mts., Rs. 1,90,185; Techno Impex (I) Ltd., 20 Mts., Rs. 2,43,539.

AVAILABLE EX-STOCK

n-VALERIC ACID
n-CAPROIC ACID
n-BUTYRIC ACID

also - Anhydrides - Esters - Salts - Other derivatives
Actual Users Please Contact for regular requirements

HELON INDUSTRIES

3, Kanta Kunj, Telly Gully,
Andheri (E),
Bombay 400 069.

## MATERIALS IMPORTED BOMBAY 7.5.90

ACRYLAMIDE: From Japan: Rich lite Industries Ltd., 15,000 Kgs Rs. 3,92,657; Simar ChemInds., 1,00 Kgs., Rs. 26,177; Surya Processors (F Ltd., 2,000 Kgs., Rs. 52,354.

ACTIVATED BLEACHIN EARTH: From Indonesia: Mulji Devsh & Co., 17,000 Kgs., Rs. 1,06,803.

ADIPIC ACID: From USA: Ralli India Ltd., 15,875 Kgs., Rs. 3,31,857

AEROSIL 200: From Belgium: Polyceat Powders Pvt. Ltd., 500 Kgs. Rs. 60,565.

ALKYLATED META PARA CRESOL: From Japan: Hico Products Ltd., 5,000 Kgs., Rs. 1,74,514.

D-ALPHA PHENYL GLYCINE CHLORIDE HYDROCHLORIDE: From Italy: Armour Chemicals Ltd., 5,775 Kgs., Rs. 23,12,763.

D-ALPHA PHENYL GLYCINE CHLORIDE HCL: From Netherlands: Armour Chemicals Ltd., 5775 Kgs., Rs. 23,46,658.

DL-2 AMINO, BUTANOL: From FRG: Lupin Labs Ltd., 30,420 Kgs., Rs. 43,591.

AMINO PICOLINE: From Switzerland: Ranbaxy Labs Ltd., 2,000 Kgs., Rs. 3,71,715.

2-AMINO-6-PICOLINE: From Switzerland: Ranbaxy Labs Ltd., 3,000 Kgs., Rs. 5,57,573.

BISPHENOL A: From Japan: J. Kirit & Bros. 8,000 Kgs., Rs. 2,15,002.

1-BROMO-3-CHLORO PROPANE: From Japan: Iranichem Pvt. Ltd., 750 Kgs., Rs. 75,562.

BUTACHLOR TECH: From FRG: Sulphur Mills Pvt. Ltd., 15,600 Kgs., Rs. 6,44,942.

BUTYL ACRYLATE MONOMER:

rom Japan: Shah Chhaganlal Lax- nand, 14,400 Kgs., Rs. 3,51,820.

UTYLETHOXY METHYL: From n: Tainwala Chemicals & Plastics, ts., Rs. 1,38,840.

UTYL HYDRO PEROXIDE: n Japan: Bhansali Engg. Polymers , 5,100 Kgs., Rs. 87,025.

UTYLATED HYDROXY ANI- LE: From Japan: Bharat Jyoti, 91.24 ., Rs. 56,731.

ALCIUM D-PANTOTHENATE: m UK: Food Specialities Ltd., 300 ., Rs. 81,149.

APROLACTAM: From Nether- ds: Petrofils Co. Pvt. Ltd., 1,25,040 s., Rs. 34,49,770; From USA: Gar- re Nylons Ltd., 125 Mts., 33,61,210; LML Fibres Ltd., 260 s., Rs. 7,71,352.

CARBON BLACK: From FRG: iversal Paints Corpn., 720 Kgs., 2,56,052.

COBALT SULPHATE 20.21%: om FRG: N.A. Lona Industries, NA, 4,60,015.

CREATININE: From Austria: dila Laboratories, 50 Kgs., 79,940.

N-CYANO ETHYL-N-ACETOXY THYL ANILINE: From USA: Amar ye Chem Ltd., 5,829 Kgs., s. 4,43,568.

2-CYANO PYRAZINE: From pan: Nirlac Chemicals, 1000 Kgs., s. 5,42,470; Vivedita Chemicals Pvt. d., 1,000 Kgs., Rs. 6,04,067.

4-CYANOPYRIDINE: From Japan: ne Chemicals, 5000 Kgs., s. 4,18,613.

CYANURIC CHLORIDE: From RG: Hickson & Dadajee Ltd., 1,800 gs., Rs. 10,70,488.

YCLOHEXYL ISOCYANATE: rom FRG: Cadila Chemicals Ltd., 200 gs., Rs. 58,191.

CYCLOPROPYLAMINE: From FRG: Cipla Ltd., 300 Kgs., Rs. 3,96,477.

CYSTEAMINE: From Japan: Ranbaxy Labs Ltd., 1,000 Kgs., Rs. 1,74,514.

DESMODUR T-80: From FRG: Indus Products Mfg. Co. 2,000 Kgs., Rs. 80,800; Jai Industries, 18,000 Kgs., Rs. 6,75,369; From Belgium: Foam Rubber Factory, 32.25 Mts., Rs. 5,96,577; Jain Industries, 71,920 Kgs., Rs. 11,45,426.

DESMOPHEN T/86: From Belgium: Foam Rubber Factory, 16.75 Mts., Rs. 1,98,859.

DI CALCIUM PHOSPHATE: From USA: Colgate Palmolive (I) Ltd., 204,508 Kgs., Rs. 15,96,363.

DICHLOROAMINO DIPHENYL ETHER: From France: Progressive Dyestuff, 1000 Kgs., Rs. 2,34,702.

DICYANDIAMIDE: From China: Jenson Paints, 17,000 Kgs., Rs. 38,242.

DIETHYLAMINE: From Turkey: Swarup Yuma Moto Pvt. Ltd., 23.1 Mts., Rs. 2,68,079.

DI ETHYLENE GLYCOL: From Korea: D. Jamnadas & Co., 5.72 Mts., Rs. 52,407.

DIETHYL THIOPHOSPHORYL CHLORIDE: From USA: Sandoz (I) Ltd., 64,800 Kgs., Rs. 26,57,500.

3,3 DIMETHYL 4,4 DIAMINO DICYCLO HEXYL METHANE: From FRG: Hindustan Ciba Geigy Ltd., 720 Kgs., Rs. 1,20,773.

DIMETHYL FORMAMIDE: From Japan: Cipla Ltd., 15,200 Kgs., Rs. 2,51,843; S.D. Fine Chem Ltd., 5,130 Kgs., Rs. 34,002.

DIMETHYL UREA: From FRG: Jay Pharma Pvt. Ltd., 4.500 Mts., Rs. 1,31,432.

DIPHENYLETHANE DI ISOCYANATE: From USA: Mihon Polyplast India (P) Ltd., 31,500 Kgs., Rs. 10,11,484.

YEAST EXTRACT PASTE AND POWDER

**Yeast Extract** is an excellent source of Protein, B-Vitamins and essential Amino Acids.

**Yeast Extract** can be effectively used as nutrient and flavour carrier in items such as: Medicated tonics ● Soups, processed snacks and savouries ● Dietary preparations ● Baby food.

**Yeast Extract** is most suitable for inclusion in microbial growth media for diagnostic and fermentation purposes.

TYPICAL ANALYSIS OF YEAST EXTRACT

| Contents | Unit | VALUE | | YE |
|---|---|---|---|---|
| | | YE Paste (High Salt) | YE Paste (Low Salt) | Powder |
| Dry Matter | % | 71.0 | 71.0 | 93.0 |
| Amino Nitrogen | % | 3.5 | 4.2 | 5.5 |
| Total Protein | % | 43.0 | 55.0 | 73.5 |
| Water Solution | 5% | Clear | Clear | Clear |
| Copper | mg/100 gm. | – | 11.0 | 14.5 |
| Iron | mg/100 gm. | – | 18.0 | 23.5 |
| **Vitamins** | | | | |
| B1 | mcg/g | 40.0 | 53.0 | 70.0 |
| B2 | mcg/g | 25.0 | 38.0 | 50.0 |
| B6 | mcg/g | 15.0 | 16.5 | 21.8 |
| Pantothenic Acid | mcg/g | 80.0 | 112.8 | 148.5 |
| Niacine | mcg/g | 150.0 | 236.8 | 313.0 |

THE INDIAN YEAST CO. LTD.

**Bombay:** 3, Walchand Hirachand Marg, Pin 400 038. Tel: 263643/267721
**New Delhi:** Gulab Bhawan, 6 Bahadur Shah Zafar Marg, Pin 110 001. Tel 3317732
**Madras:** 166 Thambu Chetty Street, Pin 600 001. Tel.: 589021
**Calcutta:** 4 Bankshall Street, Pin 700 001. Tel.: 289151/285601

Shaw Wallace

Distributors/ Agents interested in bulk quantities may also get in touch

Unitop
SURFACTANTS

NONIONICS

ETHYLENE OXIDE CONDENSATES
OF
NONYL PHENOL, OCTYL PHENOL,
FATTY ACIDS, ALCHOHOLS, AMINES
USED AS
WETTING AGENTS, EMULSIFIERS, LEVELING AGENTS
SOLUBILISERS, CLEANING AIDS

WE ALSO OFFER

SPIN FINISHES
DETERGENTS
CORROSION INHIBITORS
DEMULSIFIERS
DEFOAMERS
DISPERSING AGENTS

ANTICAKING AGENTS
DEGREASING AGENTS
LEVELING AGENTS
CONING OILS
ANTISTATIC AGENTS
AGRO EMULSIFIERS

CONTACT MANUFACTURERS
**UNITOP**
**CHEMICALS PRIVATE LIMITED**
Factory A-18, M I D C PATALGANGA, RAIGAD DIST TEL 317
Sales Office: 34-35 ISLAM BUILDING, 46 VEER NARIMAN ROAD
OPP AKBARALLYS, BOMBAY-400 023
TEL 204 8406, 204 6906, 512 5077, 512 5409, TELEX 011-3654 TPPL

**SHARE OUR EXPERIENCE & KNOWLEDGE OF SURFACTANTS**

FOR YOUR REGULAR REQUIREMENTS OF

WHITE BEESWAX
YELLOW BEESWAX &
HONEY

*PLEASE CONTACT MANUFACTURER :*

**MEHSONS CHEMICALS PVT. LTD.,**

P.O.B. No. 121
KAMLA BHAWAN, MADARI GATE,
BAREILLY 243 001 (U.P.)
PHONES : 76517, 77359, 74150, 76526
TELEX : 0577 209 ME IN
CABLE : VEGLAMUKHI - BAREILLY

**V.V.Trans**
**Investments**
**Private Limited**
ANNOUCEMENT
EXCELLENCE
THROUGH
QUALITY
**V. V. TRANS**
**Investments**
**Private Limited**

ANNOUNCES
WITH PRIDE
THE COMMISSIONING
OF THEIR PLANT FOR
THE MANUFACTURE O

**CHLORINATE**
**PARAFFIN**
**WAX**
(HNP / WAX BASED -
DIFFERENT GRADE)

FOR YOUR REQUIREMENTS
DEALERS/ACTUAL USERS
PLEASE CONTACT

**M/s. V.V. TRANS**
**INVESTMENT**
**PRIVATE LIMITED**
R.O. 43/262, New Sankalbagh
Narasinga Rao Pet,
Kurnool -- (A.P.)
**Telephone: 21381**
**Telex: 0815-216**

**BENZOYL PEROXIDE**

We supply Excellent Quality
Quality Cautious Consumers for your Bulk Requirement

Contact Manufacturers

**ROMA CHEM INDUSTRIES**

Regd. Office: 22/1044, Punjabi Colony,
G.T.B. Nagar, Bombay 400 037.
**Phones: 4073074/4092216/4093914 Resi: 483095**

**Sales Office:** Municipal Bldg., C-1, Shop No. 2 & 3,
Near Sardar Nagar No. 4, G.T.B. Nagar, Bombay 400 037.

**SILICA GEL**

a) Indicative Type
b) Non-Indicative Type
c) Powder upto 400 Mesh
The product meet all Physical and Chemical
analysis of imported Silica Gel

**PRECIPITATED SILICA**

of High Purity suitable to
(a) Rubber
(b) Pesticides
(c) etc.

Description : Almost colourless crystals
Silica as $SiO_2$ : 99.18% w/w
Iron as $Fe_2O_3$ : 0.025% w/w
Aluminium as $Al_2O_3$ : 0.025% w/w
Calcium as CaO : Negligible
Sodium as $Na_2O$ : Negligible
Titanium as $TiO_2$ : Negligible
Bulk Density : 0.7407 gm.
Water Adsorption
at 80% RH : 36.85% w/w
at 60% RH : 30.59% w/w
at 50% RH : 29.00% w/w
at 40% RH : 26.53% w/w
at 20% RH : 22.87% w/w

**HARCHEM**

*Factory:* E-7(A) Road No. 1, Vishwakarma Ind. Area, Jaipur-302 013. **Phone: 832865**
*Bombay Office:* 29, Merry Land, R.G. Thadani Marg, Worli, Bombay 400 018.
**Ph: 4939641**

*READILY AVAILABLE*

| | |
|---|---|
| **M.E.K. PEROXIDE** | **METHYL ETHYL KETONE PEROXIDE** |
| **B.P. POWDER** | **BENZOYL PEROXIDE POWDER** |
| **B.P. PASTE** | **BENZOYL PEROXIDE PASTE** |
| **T.B.H.P.** | **TERTIARY BUTYL HYDRO PEROXIDE** |
| **D.T.B.P.** | **DI TERT BUTYL PEROXIDE** |
| **T.B.P.B.** | **TERTIARY BUTYL PER BENZOATE** |
| **L.P.O.** | **LAURYL PEROXIDE** |
| **C.H.P.** | **CYCLO HEXANONE PEROXIDE** |

Please Contact:

**SHEIRAJ CHEMICALS & PHARMACEUTICALS PVT. LTD.**

*Office:* 503-A, Stock Exchange Building, 5th Floor, Dalal Street, Bombay 400 023.
**Phone: 272451/275545. Telex: 5900 GURU IN.**
*Factory:* W-265, T.T.C. Industrial Area, Rabale, Thane (M.S.)

AMMONIUM MOLYBDATE
AMMONIUM NITRATE (RCF Melt)
CALCIUM NITRATE
CALCIUM STEARATE
MANGANESE SULPHATE
NICKEL SULPHATE (Electroplating Grade)
POTASSIUM BROMATE/BROMIDE
POTASSIUM IODIDE/IODATE
STRONTIUM CHLORIDE
ZINC SULPHATE

**L C TRADERS**
(Chemicals Division)
403, "YOGESHWAR"
135/139, Kazi Sayed Street, Bombay 3.
Tel.: Off.: 331195/326542
Grams: "SULPHATES" — Chinch Bunder

Consumers & Exporters
CONTACT FOR YOUR REQUIREMENTS OF:

| | |
|---|---|
| Ibuprofen I.P. | Analgin I.P. |
| Sulphamethoxazole I.P. | Metronidazole I.P. |
| Trimethoprim I.P. | Diloxanide Furoate I.P. |
| Paracetamol I.P. | Saccharine Sodium I.P. |
| Oxyphen Butazone I.P. | Aluminium Hydroxide I.P. |
| PTS Amide | Aluminium Chloride |

NBMC
**NAV BHARAT MINERALS & CHEMICALS**
8, Haresh Chambers, 313/319, Samuel Street, Bombay-400 003.
Phones: 320510 * 332261 * 343429

**Potash Alum - 99% Min.**

Basic Chromium Sulphate
Sodium Sulphide Flakes (Iron Free)
Potassium Carbonate
Barium Carbonate/Chloride
Calcium Chloride
Potassium Bromate
Sodium Bromate

**VORA CHEMI TRADE PVT. LTD.**
265, Samuel Street, Bombay 400 003.
Phones: 333762/63/64/325265/345377

PHOSPHORIC ACID 85%

LIQUID BROMINE
& ITS SALTS

SODIUM TRIPOLY
PHOSPHATE

CAUSTIC SODA FLAKES

ACETONE

chemphos

101. M.G. ROAD. SHETTY HOUSE
2nd FLOOR BOMBAY: 400 023.
TEL. 273868, 274006, TLX: 011 3716 PHOS IN

Edited by R. Raghavan and published by N.R. Rajagopalan on behalf of owners, Sevak Publications, 306, Shri Hanuman Industrial Estate, Wadala, Bombay 400 031. Madras Office: Room No. 9, Wellingdon Estate, 3rd Floor, 24, Commander-in-Chief Road, Madras 600 105. Phone: C/o. 471659 and printed by N.R. Rajagopalan at Sevak Publications, 25, North Mada Street, Thiruvanmiyur, Madras 600 041. Phone: 419265. Registered with the Registrar of Newspapers for India vide No. R.N. 1972/57.

INDIAN
OCEAN

**Citric Acid from Citurgia. The name that spells international quality.**

The name Citurgia is today synonymous with Citric Acid of the finest quality.
Citurgia caters to more than just one need in more than just one industry. Besides the traditional usage of Citric Acid in food, soft drinks, confectionery and drugs, today the uses of Citric Acid extend to new areas:

- In the textile printing and dyeing industry it provides 'STABLE pH' conditions for polyester and nylon. As also for acrylic prints curing and cotton-resist printing. Citric Acid has successfully replaced imported Tartaric Acid because of its excellent quality, low costs and easy availability. Also, it is a very safe acid compared to other organic and inorganic acid salts.
- Citric Acid prevents flavour deterioration, rancidity and discoloration in edible oils.
- It imparts an acidic taste to dry powdered drinks.
- It is also used as a descaling solution.

Citurgia Biochemicals Ltd. is the largest producer of high quality Citric Acid in India. Besides catering to the domestic demand, Citurgia's Citric Acid is exported to USA, Japan, Germany, Australia, Iran, Malaysia, Sri Lanka and other countries.

**Citurgia Citric Acid-India's No. 1**

CITURGIA BIOCHEMICALS LIMITED
Regd. Off. Neville House, J.N. Heredia Marg, Ballard Estate, Bombay-400 038
Tel: 2618071 Gms: CITURGIA BOMBAY. Tlx: 11-73372 BDM IN

REGD. NO. TN/MS (C) 395

35th
YEAR OF
PUBLICATION

ISSN 0045/6500

R.N. No. 1972

8.22

22 AUG 1990

# Chemical Weekly

VOL. XXXV AUGUST 14, 1990 NO. 49

Reagents
Chemicals

MERCK

**Extran®**
A comprehensive range for manual cleaning
of Laboratory glassware & Equipment

**LiChrosolv®**
High Purity Solvents for HPLC

**Titrisol®**
Concentrated
Volumetric Solutions

**Buffer Titrisol®**
Concentrated
Buffer Solutions

**pH Indicator paper**
Accuracy conforming to
International standards

**Karl Fischer**
Pyridine
free

An Innovation
for determination of
moisture content

Further details available on request

**E. Merck (India) Limited**
Shiv Sagar Estate, 'A'
Dr. Annie Besant Road
Worli, Bombay-400 018
Telephone: 492 2855

- Mono Sodium Phosphate Crystal
- Mono Sodium Phosphate Anhydrous
- Di Sodium Phosphate Crystal
- Di Sodium Phosphate Anhydrous
- Tri Sodium Phosphate Anhydrous
- Tetra Sodium Pyro Phosphate
- Acid Sodium Pyro Phosphate
- Mono Potassium Phosphate
- Di Potassium Phosphate
- Tetra Potassium Pyro Phosphate
- Mono Calcium Phosphate
- Mono Ammonium Phosphate Pure
- Di Ammonium Phosphate Pure
- Di Ammonium Phosphate Tech.
- Sodium Acetate Crystal
- Sodium Acetate Anhydrous
- Zinc Acetate
- Lead Acetate
- Potassium Acetate

**A. CHOKSEY CHEMICAL INDUSTRIES**

101, M.G. ROAD, FORT, BOMBAY-400 023.
TELEPHONE : 273868, 274006
CABLE : HEXAPHOS ■ TELEX NO. 11-3716 PHOS IN

Edited by R. Raghavan and published by N.R. Rajagopalan on behalf of owners, Sevak Publications, 306, Shri Hanuma
Industrial Estate, Wadala, Bombay 400 031. Madras Office: Room No. 9, Wellingdon Estate, 3rd Floor, 24, Commander
in-Chief Road, Madras 600 105. Phone: C/o. 471659 and printed by N.R. Rajagopalan at Sevak Publications, 25, Nort
Mada Street, Thiruvanmiyur, Madras 600 041. Phone: 419265. Registered with the Registrar of N
No. R.N. 1972/57.

SEE PAGE 39 FOR CONTENTS

SILICA GEL
DICATING/NON-INDICATING/COLUMN CHROMATOGRAPHY/THIN LAYER CHROMATOGRAPHY
ACTIVATED CARBON
(POWDER/GRANULAR; CHEMICALLY ACTIVATED)
PRECIPITATED SILICA
(RUBBER GRADE/INSECTICIDE GRADE)

BUTYL STEARATE
METHYL OLEATE
COCOAMINE OXIDE
COCO DI ETHANOLAMIDE
COCO MONO ETHANOLAMIDE
COCO AMIDOPROPYL BETAINE
OCTYL STEARATE
PARA CHLORO ANILINE
COCO BETAINE
BENZALKONIUM CHLORIDE

ORTHO DICHLORO BENZENE
PARA DICHLORO BENZENE
ORTHO PHENYLENE DIAMINE
MONO CHLORO BENZENE
TRI CHLORO BENZENE
BENZYL CHLORIDE

ISO PROPYL MYRISTATE
ISO PROPYL PALMITATE
ISO PROPYL ALCOHOL
DIOCTYL SULPHO SUCCINATE LIQUID

DRIER CHEMICALS

100, Dada Saheb Phalke Road,
Dadar (East),
BOMBAY 400 014 (INDIA)

Tel.: 111051-4111661
Resi.: 4221658

Please Contact for Prompt Supplies Of:

**Anhydrous Ammonia Gas**

**IN CYLINDERS AND ROAD TANKERS**

**Also Available LIQUOR AMMONIA in Carboys and Tankers**

***Surat Ammonia Supply Company***

105, Regent Towers, Race Course Circle, Baroda 390 007.
**Phones: 323827, 321897 & 320676 * Gram: SASCO * Telex: 0175-497 SASC-IN**

**Ahmedabad Office:** M.H. ENTERPRISES, Plot No. 2018, GIDC, Vatva Phase II, Ahmedabad.
**Tel. No. Office: 336279, 348873**

**Ankleshwar Office:** J-3435, G.I.D.C. Estate, Ankleshwar-393 002, Gujarat State. **Phone: 2449.**

**Hyderabad Office:** SUPERCHEM AGENCIES, Godown No. 1, Behind Bakelite Hylam, Industrial Estate
Sanathnagar, Hyderabad-500 018. **Telephone No. 263812.**

**Poona Office:** POONA GAS & CHEMICAL CO., Ratnakar, 8/16, Karve Road, Poona-411 004.
**Phones: 431110, 420330, 421695.**

**Vapi Office:** Shed No. 19, C-1, B. Type. Vapi Industrial Estate, G.I.D.C., Vapi-396 195. **Phone: 685.**

***BOMBAY AMMONIA & CHEMICAL CO.,***

204, B-Wing, Neelam Centre, 2nd Floor, Hind Cycle Road, Behind Glaxo, Worli, Bombay 400 025.
**Phones: 4948652/4948659/4949544/4946686.**

**The most reliable name in Chemical**

**DIAMINES**

**International quality** **Indigenously available**

**AMINO ETHYL PIPERAZINE (AEP)**

- Epoxy Curing Agents
- Corrosion Inhibitors
- Asphalt Additives
- Emulsifiers
- Pharmaceuticals
- Surfactants

For
Rubber and
other Polymers,
Lubricating
and Fuel Additives,
Electroplating,
Mining and Metal Recovery,
Coating and Adhesives,
Surfactants and Softeners.

**TETRA ETHYLENEPENTAMINE (TEPA)**

**PIPERAZINE (PIP) ANHYDROUS**

Intermediate for
Pharmaceuticals,
Rubber Accelerators,
Corrosion Inhibitors
and
Surface Active Agents

From the only manufacturers in India

**DIAMINES AND CHEMICALS LIMITED**
International Quality with Indigenous Ingenuity.

**Ahmedabad (H.O) :** 1 National Chambers Ashram Road
Ahmedabad 380 009 Phone 409626 Gram DIAMINES
**Baroda (Works) :** Plot No 13, P.O. Petrofils - 391 347, Dist Baroda
Phone 73305 406 Gram DIAMINES Telex 0175 352 DACLIN
**Bombay Office :** 85 C Wing Mittal Towers 8th Floor Nariman Po
Bombay 400 021 Phone 2029507 Gram CELAGAR

Navnit/307

IMPORTED RAW MATERIALS AVAILABLE
WITH **MODVAT & DUTY DRAW BACK** BENEFITS

**PHARMACEUTICALS, COSMETICS FOODS**

- * PROPYLENE GLYCOL U.S.P.
- * AEROSIL - 200 N.F.
- * P.V.P. K-25/30/90 U.S.P.
  (PLASDONE/KOLLIDONE/POVIDONE)
- * ETHYL CELLULOSE N.F.
  N-7, 10, 20/22, 45/50, 200
- * METHYL CELLULOSE N.F.
  Grades: CULMINAL-MC 400, 4000 CPS
- * HYDROXY ETHYL CELLULOSE
  Grades: NATROSOL 250 LR/GR/MR/HBR
- * HYDROXY PROPYL CELLULOSE N.F.
  Grades: KLUCEL EF/LF/GF/HF
- * HYDROXY PROPYL METHYL CELLULOSE
  U.S.P.-2910
  METHOCEL/PHARMACOAT/METOLOSE
  METHOCEL E3/E5/E15/E50, E-4M, F-4M
  METHOCEL K-100, K-4M, K-15M
  PHARMACOAT 603, 606, 615
- * MICROCRYSTALINE CELLULOSE U.S.P./N.F.
  AVICEL PH 101/PH 102/RC-581/RC-591
- * CROSSLINKED NaCMC, U.S.P.
  AC-DI-SOL (TABLET DISINTEGRANT)
- * SODIUM STARCH GLYCOLATE U.S.P.
- * CROSPOVIDONE U.S.P. (DISINTEGRANT)
  KOLLIDONE CL/POLYPLASDONE XL
- * SODIUM CARBOXY METHYL CELLULOSE
  (FOOD/DENTAL/U.S.P. GRADES)
- * TITANIUM DIOXIDE U.S.P. (SUPERWHITE)
  ANATASE GRADE - BACTERIA CONTROLLED
- * CARBOMER/CARBOPOL 934, 940
- * VEE GUM/VEE GUM HV
- * XANTHAN GUM
- * PARA CHLORO META CRESOL B.P.
  (PREVENTOL CMK - CHLOROCRESOL)
- * P.E.G. 400/4000/6000/8000
- * POLYPROPYLENE GLYCOL (P.P.G.)
- * EUDRAGIT (ALL GRADES)
- * DL-LACTIC ACID, 88-92%, U.S.P.
- * POLYSORBATE (TWEEN 80) U.S.P.
- * VANILLIN/ETHYL VANILLIN
- * N-METHYL-2-PYRROLIDONE (NMP)
- * TERTIARY BUTYL HYDROQUINONE
  (ANTIOXIDANT - T.B.H.Q.)
- * OPADRY
- * CELLULOSE ACETATE PHTHALATE U.S.P.
- * HYDROXY PROPYL METHYL CELLULOSE
  PHTHALATE U.S.P.
- * POLYVINYL ACETATE PHTHALATE U.S.P.

**BULK DRUGS INTERMEDIATES**

- * TETRAHYDROFURAN
- * TERTIARY BUTYL AMINE
- * N-PROPANOL PURE (Undenatured)
- * HYDROXYLAMINE HYDROCHLORIDE
- * ADIPIC ACID
- * BENZALDEHYDE

PLEASE CORRESPOND WITH MR. MUKESH KAMDAR / MR. HARISH SHAH
AT

**CROWN CHEMICAL PRODUCTS**

**AT OUR NEW OFFICE ADDRESS**

305-B, NEELAM CENTRE, HIND CYCLE ROAD, WORLI, BOMBAY - 400 025
TELEPHONE: OFFICE: 493 7725, 493 7726, 493 7727, 493 4141
RESI: 409 3892, 407 5245, 646 3287
TELEX : 011-73926 CRWN IN
TELEFAX: 2040390

FOR YOUR REQUIREMENTS FROM READY STOCK:

**CHEMICALS:**

Thiourea
Hyflosupercell
Trichloroethylene
PVC Resin Suspension 67-D
Toshiba Silicon Emulsion
TSM-630
Ceto Stearyl Alcohol
Alfol 1618-H
Hydrogen Peroxide 20%
Cresylic Acid
Monoethylene Glycol
Methylene Chloride
Methyl Ethyl Ketone
Cellosolve Methyl
Acrylamide
Methyl Isobutyl Ketone
Glyoxal 40%
Peppermint Oil
Beta Picoline
L Lysine Monohydrochloride
Adipic Acid
Gum Rosin N Grade
Portable Generator
Paraformaldehyde 91% & 96%
Butyl Acrylate Monomer
2-Ethyl Hexyl Acrylate
Potassium Carbonate
Low Density Polyethylene
Hydrazine Hydrate 30% & 80%
Ammonium Persulphate
Polyvinyl Alcohol 173 &
GH-17
Laboratory & Reagent
Chemicals
Methyl Methacrylate
Pentaerythritol
Bromine Liquid
Citric Acid B.P. 80
Isopropyl Alcohol
Diethylene Glycol
Titanium Dioxide B 101
Rangolite 98%
Epichlorohydrine
Thymol Crystal
Cellulose Acetate Scraps

**INTERMEDIATES**

Cyanuric Chloride
Benzaldehyde
Chrome Oxide
N-N-Diethylaniline
Naphthalene Crude
Sodium Formate
Sodium Chromate Yellow

Please Contact:

**GUPTA TRADING COMPANY**

5, Apeejay House, 130, Apollo Street, Fort, BOMBAY - 400 023

Phone Nos. Office: 244403/222059 * Resi: 8229085/8121281 Gram: "CARPEDIUM"

---

**H-ACID**

**Quality & Reliability**

From:

**SHREEJI COLOUR CHEM INDUSTRIES**

(A Division of Himland Silk Mills Pvt. Ltd.)

**Catering To The Needs of Domestic & Export Markets for over a Decade**

**Works:**

129/1/B, G.I.D.C.,
Nandesari - 391 340,
Dist. BARODA
Tel.: 60214

**Bombay Office:**

Oriental Bank Building,
Office No. 11 B, 2nd Floor,
65, M.G. Road,
Fort, BOMBAY 400 023.
Tel.: 275916.

**NOW AVAILABLE:**

**96% A.D. DODECYL BENZENE SULPHONATE**

**(HARD ACID SLURRY)**

**LINEAR ALKYL BENZENE SULPHONATE**

**(SOFT ACID SLURRY)**

**SULPHONATED WITH SULPHUR TRIOXIDE**

**MANUFACTURERS:**

TRADE MARK

**Arochem Silvassa Ltd.,**

Industrial Estate, Silvassa 396 230 -- Via Vapi,
Dadra & Nagar Haveli.
**Phone: 289, 291 Gram: AROCHEM SILVASSA**
**Telex: 0185 201 ARCM IN**

**BOMBAY** : Scent House, Station Road, Goregaon (West), Bombay 400 062.
**Phone: 6722280, Gram: AROSILVASSA,**
**Telex: 011-70038 FAIS IN, Fax: 022-672 0818.**

**KANPUR** : Chemdet Enterprises, Shop 67, 75/232, Sabji Mandi, Kanpur.
**Gram: SCENTOUS, Telephone: 64551.**

**MADRAS** : Syndet Enterprises, 90, Govindappa Naick Street, Madras 600 001.
**Gram: SCENTOUS, Telephone: 569032.**

**DELHI** : B. Shantilal & Co., 1025/5, First Floor, Gali Teliyan, Tilak Bazar, Delhi 110 006.
**Gram: INDOSIL, Telephone: 291 3973.**

*AVAILABLE REGULARLY*

***SPRAY DRIED 40%***
***A.D. ANIONIC DETERGENT***
***POWDER NEUTRAL-pH: 7-7.5***

**In Snow White Colour & Free Flowing**
**Bulk Density below 0.3**

Manufacturers

***Silvassa Syndet Private Limited***

Amli Industrial Estate,
SILVASSA - 396 230 -- Via Vapi,
Dadra & Nagar Haveli
**(Phone: 685)**

India's Multinational and Leading Consumers prefer only KGI's Gum
The top quality products
For Your Regular Requirements of:

**Gum Accacia**
(Powder & Crystal)

**Guar Gum**
(Pharma & All Other Grades)

**Gum Tragacanth**
(BPC Standard)

**Gum Arabic * Clove Oil**

WE CAN SUPPLY AS PER NEW I.P. 1985
WITH MICROBIOLOGICAL TEST

Please Contact:

**KAPADIA GUMCHEM INDUSTRIES**

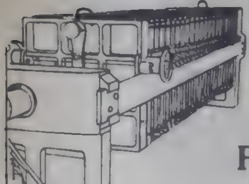
Together We Progress

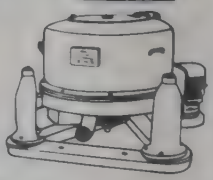
G.P.O. Box No 1160, 3 Mint Road, 2nd Floor, Opp. G.P.O., BOMBAY 400 001.
Phones; 2611087/2615073/2617217 Resl.: 6205517/6207028 Gram: PHARMAGUM
Fax No.: 91-22-2612659 Attn.: Mr. RAMESH KAPADIA

**FILTERCLOTH! FILTERCLOTH!**

India,s Multinational National and Leading Manufacturers Prefer Filter Cloth
From:-

**POPAT BROTHERS**





For CHEMICALS, CEMENT, CERAMIC, DYES, OIL,
RUBBER, PAPER, SUGAR, and other Industries
in Cotton, Synthetic, Nylon, Polyester (Terylene) Polypropylene, and others,
We also offer Centrifuge/Nutch Bags, Filter press Pieces as per your requirement

For detailed Information write to:

**POPAT BROTHERS**

249, YUSUF MEHERALI ROAD, P.B. BOX NO. 13074
OLD MASJID BUNDER ROAD, BOMBAY: 400 003 (INDIA)
TELEX: NO. 011-75622 DHCO IN GRAM: POPBROS TEL: 327101 / 343957

PRINT-DESIGN 422 3615

## AVAILABLE REGULARLY

DIETHYL OXALATE (D.E.O.)
ACETIC ACID (GLACIAL)
ETHYL ACETATE
ACETIC ANHYDRIDE
ACETONE
BENZENE
TOLUENE
CAUSTIC SODA LYE
CAUSTIC SODA FLAKES
LIQUID CHLORINE

SULPHURIC ACID
HYDROCHLORIC ACID
NITRIC ACID
OLEUM 20/23/65%
PHOSPHORIC ACID
METHANOL
ANILINE OIL
PYRIDINE 2°
SODIUM METAL
OXALIC ACID

CITRIC ACID
MONOCHLORO ACETIC ACID (M.C.A.)
HYDROXYLAMINE SULPHATE (H.A.S.)
ACETYL SULPHANILYL CHLORIDE (A.S.C.)

Please Contact

BAJAJ

# BAJAJ ENTERPRISES

102, Yogeshwar, 135/139, Kazi Sayed Street, Bombay 400 003.
**Telex: 11-75969 BJAJ-IN** **GRAM: CAUSTICLYE**
**Phone: 348406/335133/333171** **Resi.: 653581**

*Branch Office:*

Arunodaya Apartments,
1st Floor,
Room No. J,
7-1-70, Dharam Karan Road, Ameerpet,
HYDERABAD 500 016.
**Phone: 228004/36472**
**Telex: 425-2163 BJAJ IN**
**Gram: CAUSTICLYE**

89, Chandan Society,
Opp. Yashoda Nagar Tekro,
Ahmedabad Bombay Highway,
Yashoda Nagar,
AHMEDABAD.
**Phone: 834546**

CONSUMERS & EXPORTERS CONTACT FOR YOUR REQUIREMENTS OF

DIMETHYL
SULPHATE

NOW AVAILABLE IN TANKERS TOO

FOR PROMPT DELIVERY PLEASE CONTACT MANUFACTURERS:

GANESH CHEMICAL INDUSTRIES

74, Matru Smruti, Road No. 4, Scheme No. 6, Sion (East), Bombay-400 022.

Phone: 4077431/4077432/4077433/4076052

REW

*YOUR SEARCH FOR QUALITY PRODUCTS END AT*
RICHARD ENGINEERING WORKS

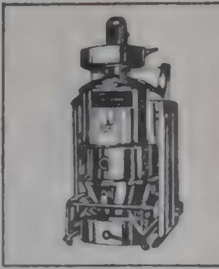
WHICH IS SERVING THE CHEMICAL INDUSTRY ALL OVER INDIA AND ABROAD FOR THE LAST 25 YEARS WE ARE KNOWN FOR QUALITY AND MAINTENANCE FREE EQUIPMENTS

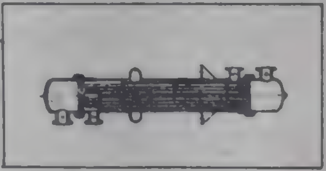
MANUFACTURERS OF:

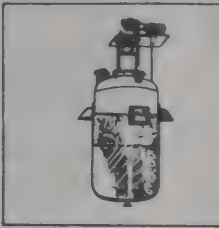
☐ FLUID BED DRYER ☐ TRAY DRYER ☐ DRUM DRYER ☐ FLAKER ☐ CENTRIFUGE ☐ LEAF FILTER ☐ PRESSURE FILTER ☐ PRESSURE VESSEL ☐ OPEN REACTION VESSEL ☐ REACTION KETTLE ☐ AUTO—CLAVE ☐ EVAPORATOR ☐ HEAT EXCHANGER ☐ DISTILLATION COLUMN ☐ CRYSTALISER ☐ BALL MILL ☐ BLENDER ☐ GRANULATOR ☐ STORAGE TANK (M.S., S.S., F.R.P., RUBBER LINED ALUMINIUM AND LEAD BONDING) ☐ HYDRO GENERATOR & OTHER CHEMICAL EQUIPMENTS

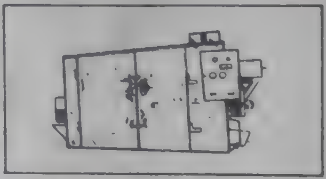
WE UNDERTAKE PROJECTS ON TURN-KEY BASIS

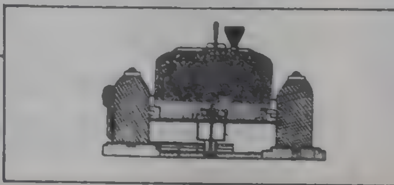
*CONTACT:* RICHARD ENGINEERING WORKS
M.I.D.C. CHEMICAL ZONE, AMBARNATH-421501. PHONE: 2513











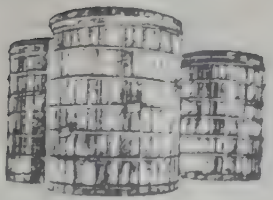
In a world that is
hard pressed
for quality.

POLYPROPYLENE FILTER PLATES, FRAMES AND RECESSED PLATES have been used extensively in advanced countries for more than a decade.

Experience shows that Polypropylene is an ideally suited material for filter pressing duties.

Advantages

* Light in weight.
* Strong and stable
* Non Corrosive.
* Heat and Chemical Resistant.
* Maintenance Free.



**nmp**

**Wooden Vats**
**Size 250 litres to 60,000 litres**

Widely used in:
Chemical, Pharmaceutical, Metallurgy, Food and Ceramic Industries and also used in clarification of Industrial and Municipal sewage.

POLYPROPYLENE RECESSED FILTER PLATES

**AVAILABLE IN A WIDE RANGE OF SIZES TO SUIT ANY FILTER PRESS UPTO 48" (1200 mm.)**

**M/s. N. M. P. Equipments Corporatjon.**
Near Railway Crossings,
Chimodia naka,
BILIMORA: 396 321. Dist. Valsad.
Tel. No.: 02634 - 2148 (O) 2463 (R)

NOW AVAILABLE REGULARLY AT MOST COMPETITIVE RATES:

STARCH POTATO I.P.
STARCH SOLUBLE G.R./L.R.
STARCH SOLUBLE Bacto Grade
STERYL POTATO STARCH
SODIUM STARCH GLYCOLATE U.S.P.
FROM MAIZE/POTATO STARCH

CHOLINE DIHYDROGEN
CITRATE
PURE & 50%/70% SOLN.
CHOLINE BITARTRATE PURE
CHOLINE SALICYLATE PURE
TRICHOLINE CITRATE Min 65%

We also offer

(a) BARIUM CARBONATE (b) BARIUM CHLORIDE
(c) BARIUM SULPHATE POWDER I.P.
(d) BARIUM SULPHATE SUSPENSION 95% W/V B.P.
(e) BARIUM SULPHATE SUSPENSION 120% W/V B.P. (SWALLOW

Contact Manufacturers

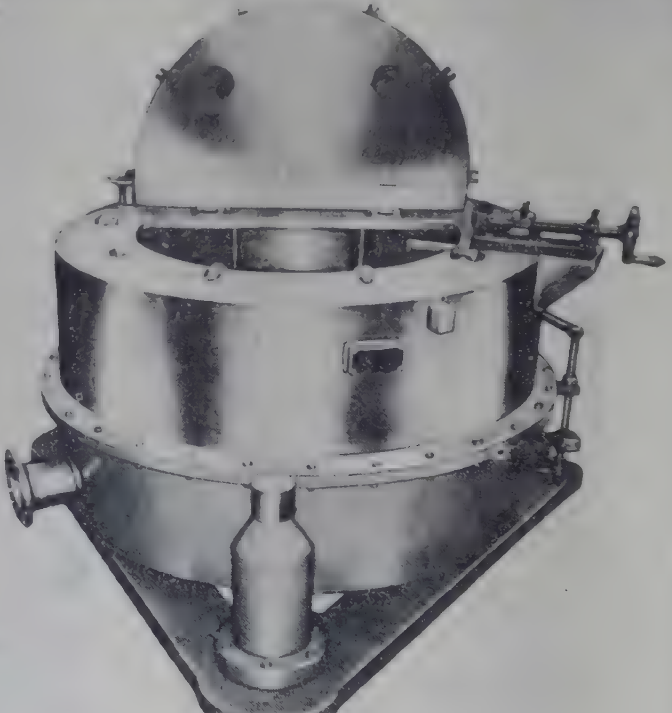
NATIONAL DRUGS AND CHEMICALS

75, Jawahar Nagar, Goregaon West, Bombay 400 062.
Phone: 6723224

---

*Introducing*

NEW 'ROTEX' BOTTOM DISCHARGE CENTRIFUG



With
1) Scrapper
2) Variable Speed
3) Efficient solid discharge system through single outlet in vapour tight condition.
4) Basket Dia range from 910 mm to 1520 mm.

ALSO AVAILABLE BAGLIFT TYPE AND
MANUAL TOP DISCHARGE CENTRIFUGES
MADE TO YOUR SPECIFIC REQUIREMENTS.

SUKHRAS MACHINES Associates: HYDROCHEM ENGINEERS
Off: 145, Adarsh Industrial Estate, Sahar Road, Chakala, Andheri (E) Bombay 400 099 (IND
Tel. 6322721, 6325957 Telex : 011-79179 TAM IN GRAM: 'TAMHYDRO', Andheri, Bomba

**The Planet Earth is the greatest chemist we know.**

What fecund and creative chemistry.
Every human, plant, animal, rock, gas or liquid on earth has a simple or complex chemistry behind it. The idea of so much thought and unconscious formulation seems mind-boggling, but Nature does it regularly and effortlessly.
It inspires us.

Process chemicals for the textile industry for Sizing, Desizing, Mercerising, Scouring, Dyeing, Printing and Finishing.

SUPERTEX™

SUPERTEX®
(INDIA) CORPORATION
132, Dr. Annie Besant Road, Bombay-400 018
Phone: 493 6041, 493 38 18, 493 5482.
Grams: 'Thinogum'. Telex: 75643.

a M.G. Saraf Enterprise
Most trusted name in chemicals.

For most competitive quotation, best quality, prompt delivery of

**CLOVE OIL (Pharma Grade)**
**CINNAMON OIL (Pharma Grade)**
**ANETHI OIL (Pharma Grade)**
**CASSIA OIL (Pharma Grade)**
**AJOWAN OIL (Pharma Grade)**
**ORANGE OIL (Pharma Grade)**
**CINNAMON LEAF OIL (Pharma Grade)**
**ALMOND OIL (Pharma Grade)**
**LEMON OIL (Pharma Grade)**

Please Contact Manufacturers:

**CHEMICAL PROCESS CONSULTANTS**

Unit 202, Adarsh Ind. Estate, Sahar Road, Chakala, Andheri (East), BOMBAY 400 099.
**Tel: 6325855** **Gram: KEMIPROSS**

---

**GOOD NEWS!!!!**

**Your Search for a GENUINE, RELIABLE and COMPETITIVE SUPPLIER of Imported Pharmaceutical, Cosmetic Auxiliaries with MODVAT benefit ends here**

1. KOLLIDONE/PLASDONE U.S.P. (Polyvinyl Pyrrolidone -- BASF Pharmaceutical Grade)
2. HYDROXY PROPYL METHYL CELLULOSE (Methocel E-5, E-15, E-50) Pharmacoat 603, 606, 615.
3. ETHYL CELLULOSE Dow/Hercules (N-7, 10, 20/22, 50, 200)
4. VEEGUM N.F. (U.S.P.) Pharma Grade
5. CARBOPOL 934, 940 (BF GOODRICH)
6. HYDROXY ETHYL CELLULOSE (Natrosol 250 LR/GR)
7. METHYL CELLULOSE (400, 4000 CPS)
8. TERTIARY BUTYL HYDROQUINONE (T.B.H.Q.) Eastman Kodak, U.S.A.
9. LACTIC ACID 88-92% U.S.P.
10. TETRA HYDROFURAN
11. VANILLIN/ETHYL VANILLIN USP
12. HYDROXYLAMINE HYDROCHLORIDE
13. PROPYLENE GLYCOL U.S.P. (DOW/JAPAN)
14. ADIPIC ACID

Kindly Contact us for your specific requirements

**Mr. ZUBIN ZAVERI / Mr. ANIL ZAVERI**

SPECIALITY CHEMICALS

**TRANS-CHEM CORPORATION**

208-209, Adamji Bldg., 413, Narsi Natha Street, Bombay 400 009.
**Tel.: 334290/336404/345910; Resi: 5126843. Telex: 011-75197 STCO IN**

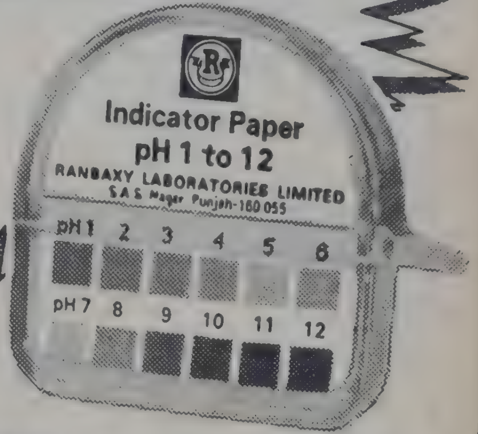
*Delhi Office:* **SANTOSHEEL DISTRIBUTORS**
CM-2, Ansals Dilkush Industrial Estate, G.T. Karnal Road, Delhi 110 033. Tel.: 7223410/2523265

**WE BELIEVE IN QUALITY OF QUANTITY**

Another first
from Ranbaxy

*Unique
dispenser —
first time in India!*

**RANBAXY'S**
**Indicator Papers**
for pH measurement that's
simple, fast and economical



**Ranbaxy's range of Indicator papers**

pH 1 — 12
pH 0 — 3.0
pH 3.0 — 5.5
pH 4.5 — 7.5
pH 6.0 — 8.0
pH 8.0 — 9.5

Ranbaxy's Indicator papers come in both wide and narrow range papers and together cover the entire pH range. The wide range papers show a distinct colour change for each pH unit and narrow range papers for each half pH unit.

The unique dispenser pack available for the first time in India protects the indicator paper from fumes and spillages providing an optimum shelf life.

Each dispenser contains one roll of 4.8 m length (alongwith a colour chart), sufficient for about 200 tests.

*For your requirements, please contact:*

RANBAXY
LABORATORIES LIMITED

Chemical Division Marketing Office
16, Marina Arcade, Connaught Circus
New Delhi - 110 001
Phones : 323738, 323739;
Telex : 031 4220
Cable : RANBAXYLAB
CONNAUGHT CIRCUS

Put **RANBAXY** Reliability in your Laboratory!

We offer following Speciality Chemicals
from ready stocks

We offer following
speciality chemicals fro
incoming consingment

WITH MODVAT BENEFIT

1. CARBOPOL 934 & 940 N.F.
   (B.F. Goodrich USA)
2. H.P.M.C. 2910 USP/PREMIUM
   Methocel E 5, E 15, K 100, E4M
   Methocel E 6/Pharmacoat 606
3. EUDRAGIT (Rohm Pharma GmbH)
   L 100, Rs PM, L 30 D, E 30 D
4. MICROCRYSTALLINE CELLULOSE N.F.
   Avicel PH 101 & PH 102 (FMC USA)
5. SODIUM STARCH GLYCOLATE USP
   Primojel USP (AVEBE Holland)
6. XANTHAN GUM N.F.
7. HYDROXY ETHYL CELLULOSE
   Natrosol 250 LR / 250 GR
8. ETHYL CELLULOSE N.F./USP
   N-10, N-20, N-50

1. H.P.M.C. 2910 USP/PREMIU
   Methocel E 15 LV / E 50 L
   Methocel K4M/E4M/F4M
2. VEEGUM N.F., HV, K, F
   (Vanderbilt Trade USA)
3. H.P.M.C. Phthalate USP
   (Shin Etsu Japan)
4. EUDRAGIT L 100, RL 100
5. AVICEL PH 102 N.F./USP
   (FMC Corpn. USA)

Please Contact for your specific requirements

Mr. VIJAY DOSHI

**M/s. PIOMA CHEMICALS**

11, Bombay Talkies, Malad (West), Bombay 400 064.
Tel: 682 0626. Telex: 011 70076 PCO X IN. Fax: 682 2757 ATTN: VIJAY DOSHI, PIOMA

FOR YOUR REQUIREMENTS OF:

**INDOLE**
**ANETHOLE (99.9%)**
**MUSK XYLOL**
**(Powder & Crystal)**
**MUSK KETONE**
**PHENYL ACETIC ACID**
**ROSE CRYSTALS**
**LINALOL**

Please Contact:

**D.D. SHAH &CO.**

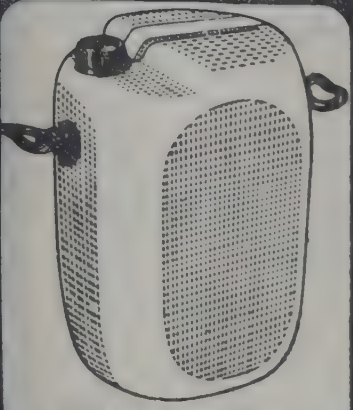
DAMODAR BUILDING, 105, PRINCESS STREET, BOMBAY 400 002.
TEL. NOS.: 31 20 55 / 29 35 54 / 29 05 74
TLX. NO.: 011-5732 DDS IN CABLE: FORENOON BOMBAY 400 002.

H.D.P. WHITE & BLACK

# JERRY CANS, CARBOYS & JARS

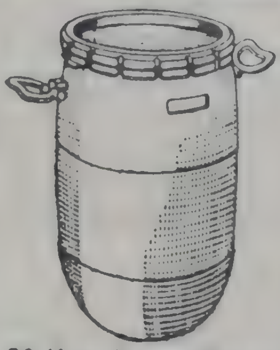
from PIL'S Virgin material

manufactured on IMPORTED Machines

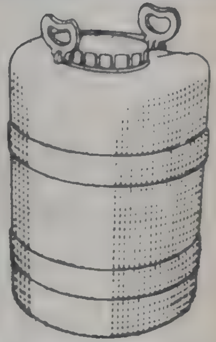


50 Ltrs. Jerry Can

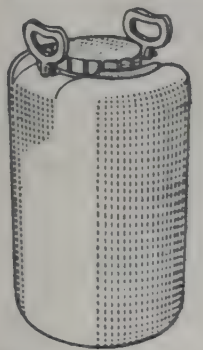
50 Kgs. Round Drum
Full Top Open – 12″ Cap



30 Kgs. Round Drum
Full Top Open – 10″ Cap

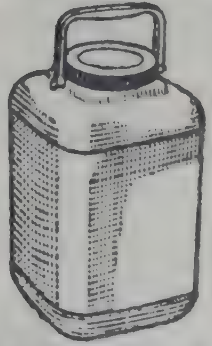


50 Kgs. Round Drum
– 6″ Cap

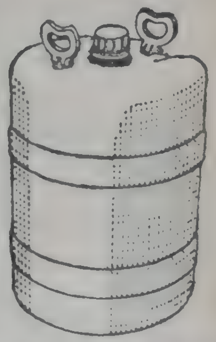


30 Kgs. Round Jar
– 6″ Cap

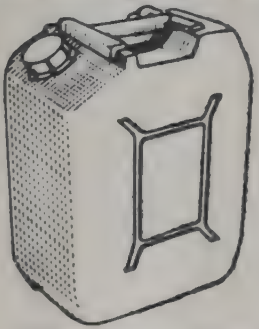
20 Kgs. Round Jar
– 6″ Cap



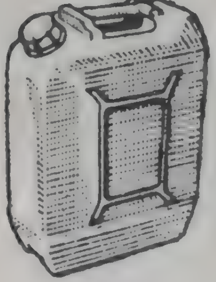
6 Kgs. Square Jar
– 4″ Cap



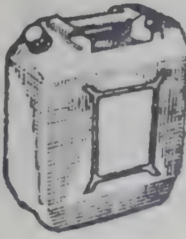
50 Kgs. Round Drum
– 2″ Cap



30 Ltrs. Jerry Can
Stackable

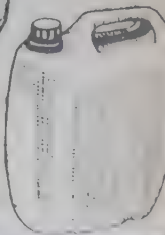


20 Ltrs. Jerry Can
Stackable



10 Ltrs. Jerry Can
Stackable

5 Ltrs.
Jerry Can



6 Ltrs.
Jerry Can

**Rajdeep Plastics**

FOR YOUR REQUIREMENTS KINDLY CONTACT
17, JAMNADAS INDUSTRIAL ESTATE,
OPP. JAWAHAR TALKIES, DR. R.P. ROAD,
MULUND (W), BOMBAY 400 080.
PHONES: 5613344 ● 5616688

**ATTENTION ► END USERS, EXPORTERS**

**YOUR SEARCH FOR THE BEST QUALITY OXALIC ACID ENDS HERE!**

**OVER 99% PURITY**

*Paschim Chemicals Pvt. Ltd.*

**Admn Office:**
402, Chartered House. 293/299
Dr. Cawasji Hormasji Street,
Marine Lines Bombay-400 002.
Tel 253421, 297158.

**Regd. Off:**
524, Cotton Exchange
Kalbadevi Road
Bombay 400 002
Tel: 314637

PCI SILICONES

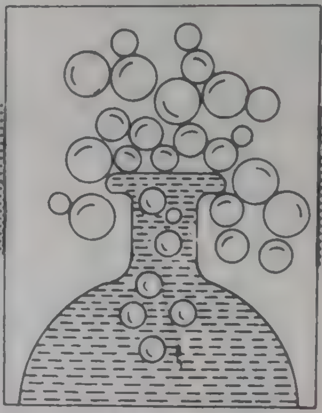
ATTENTION !

Actual Users/Dealers/Stockists Reduce Your Cost By Using Our Products

**PREMOULD-600**
SILICONE MOULD RELEASE AGENT
FOR RUBBER INDUSTRIES

**PRESIL-300**
SILICONE EMULSION FOR
TEXTILE INDUSTRIES

**& AMINO SILICONES**



**MULTI FOAMER N.P. J.**
SILICONE DEFOAMER,
ANTI FOAM EMULSION

Please Contact:

**SHREE SILCHEM INDS. PVT. LTD.**

Shah & Nahar Industrial Estate, A-1, Gala No. 109, 1st Floor, Near Sun Mill Compound, Lower Parel (W), Bombay - 400 013.
PHONE : 4949771 — 4942176 — 4945869
Branch: 538, Jash Market, Ring Rd., SURAT-395 002. PHONE: 40136

If the history of planet Earth can be seen as 1 day, then,

1) The Human species arrived only 10 minutes ago.
2) Civilization is only 5 seconds old.
3) The Industrial Revolution only 1/8th of a second.
Yet so much has been achieved in 1/8th of a second.

Superchem making the most of 1/7th of 1/8th since we arrived 'only' 30 + years ago;

Process chemicals for the textile industry for Sizing, Desizing, Scouring, Mercerising, Dyeing, Printing and Finishing.

SUPERCHEM®

SUPERCHEM®
132, Dr. Annie Besant Road, Bombay-400 018
Phone: 493 6041, 493 38 18, 493 5482.
Grams: 'Thinogum'. Telex: 75643.

a M.G. Saraf Enterprise
Most trusted name in chemicals.

AVAILABLE FOR EXPORTERS AND DOMESTIC CONSUMERS

**SODIUM BI SULPHITE** Tech/Photo/Pure
**SODIUM META BISULPHITE** Tech/Photo/Pure
**SODIUM SULPHITE** Tech/Photo/Pure
**SODIUM CARBONATE MONO HYDRATE**
Tech/Photo/Pure
**AMMONIUM THIO SULPHATE 60% SOLUTION**

Contact Manufacturer

**MEHTA SULFITES (IND) PVT. LTD.**

215/216, Swastik Chambers, Sion Trombay Road, Chembur, Bombay 400 071.
Telex: 011 72334 GROW IN Tel.: 528283/4/5 Gram: SULFINDIA, P.B. No. 17222.

Available Regularly at Most Competitive Rates

**PROPYLENE GLYCOL**
(All Grades)
**EPICHLOROHYDRINE**
**ISOPHTHALIC ACID**
**STYRENE MONOMER**

Please Contact:

**KIRAN N. AGRAWAL**

Alankar Building, 3rd Floor, 208, Samuel Street, Bombay 400 003.
**Phone: 335041 to 46**

FOR YOUR REGULAR REQUIREMENTS AND EXPORT

*** DYES:**
(NAPHTHOLS, RED TR BASE, RED KB BASE, SALTS, RAPIDOGENS)

*** INTERMEDIATES:**
META NITRO ANILINE (MNA)
META DI-NITRO BENZENE (M-DNB)

CONTACT:
**DALAL ENTERPRISE**

* ANTHRAQUINONE

* ORTHO BENZYL BENZOIC ACID (OBB)

* BENZANTHRONE

CONTACT:
**PHOENIX PETROCHEMICALS PVT. LTD.**

*FACTORY:* PLOT NO. 7, G.I.D.C. ESTATE, NARODA, AHMEDABAD 382 330, INDIA
*OFFICE:* SHANTIKUNJ, PALDI, AHMEDABAD 380 006, INDIA.
**Telephone: (O) 78520, 76042; (F) 811519, 810305**
**Telex: 0121-7071 RAVI-IN * Fax: 272-411148**
We also invite interested parties for area distributorship

*Where Quantity & Quality Matter*
*always Count on....*

KC
KRIPA'S

**ACID SLURRY**

**SODIUM LAURYL SULPHATE**
**(POWDER, NEEDLES & LIQUID)**

**SODIUM LAURYL ETHOXY SULPHATE**

**INDUSTRIAL DETERGENT 40%**

**HOUSE HOLD DETERGENT POWDER**
**SPRAY DRIED - 25 Kgs. BULK PACKING**

KC
KRIPA'S

**KRIPA CHEMICALS PVT. LTD.**

**Admn. Office:**
8/9/10 'Royal Chambers',
S. No. 47, Paud Rd., PUNE-411 038.
**Phone: 333245, 331825, 331855**
**Telex: 0145-729 KRIPIN**

**Branch Office:**
House No. 1024, 10th Main Road,
West of Chord Road, IIIrd Stage, 1st Block,
Bangalore-560 079 **Phone:** 357393

INT-DESIGN

MANUFACTURERS OF

**SODIUM NAPHTHIONATE**

**ARUN CHEMI-DYES**

**Regd. Office:** Chemical Development Compound,
Manpada, Ghodbunder Road, Thane 400 607.
**Phone: 502220/502726**
**Telex: 1172335 ARUN IN**
**Fax: 91-22-595224, 91-22-5115904**

---

**Ethylene Dichloride 250 Kg. HDPE Drum Packing   Formaldehyde 220 kg. HDPE Drum Packing**

**TRIETHANOLAMINE   DIETHANOLAMINE   MONOETHANOLAMINE**

**ETHER PETROLEUM 40-60/60-80/80-100/80-120/90-100/100-120   OLEIC ACID TECH**

**AMYL ACETATE**
**BUTYL CELLOSOLVE ACETATE**
**BUTYL CARBITOL ACETATE**
**CELLOSOLVE ACETATE**
**MONOCHLORO BENZENE**
**TRICHLORO BENZENE**
**PARA DICHLORO BENZENE**

**CARBITOL ACETATE**
**ISOPROPYL ACETATE**
**METHYL ACETATE**
**OCTYL ACETATE**
**ORTHO DICHLORO BENZENE**
**ISO AMYL ALCOHOL**

**TRIETHLAMINE**
**DIETHYLAMINE**
**MONOETHYLAMINE**
**MONOISOPROPYLAMINE**
**DIISOPROPYLAMINE**
**MONOCYCLOHEXYLAMINE**
**DICYCLOHEXYLAMINE**

For INK / VARNISH / PAINTS Mfgs
**MALEIC RESIN (Spirit Soluble / Oil Soluble)**
**POLY VINYL BUTYRAL (P.V.B.)**

QUALITY CSC SOLVENTS

**Chemical Solvent Centre**
43, Princess Street, 3, Devkaran Mansion, 1st Floor, Bombay 400 002.
**Office: 314293 * 313812 * 254853   Resi: 8114061 * 6301104**
**Gram: CHESOLVECE * Telex: Asim 011-73145**

---

AVAILABLE FROM READY STOCKS
**WITH MODVAT BENEFIT**

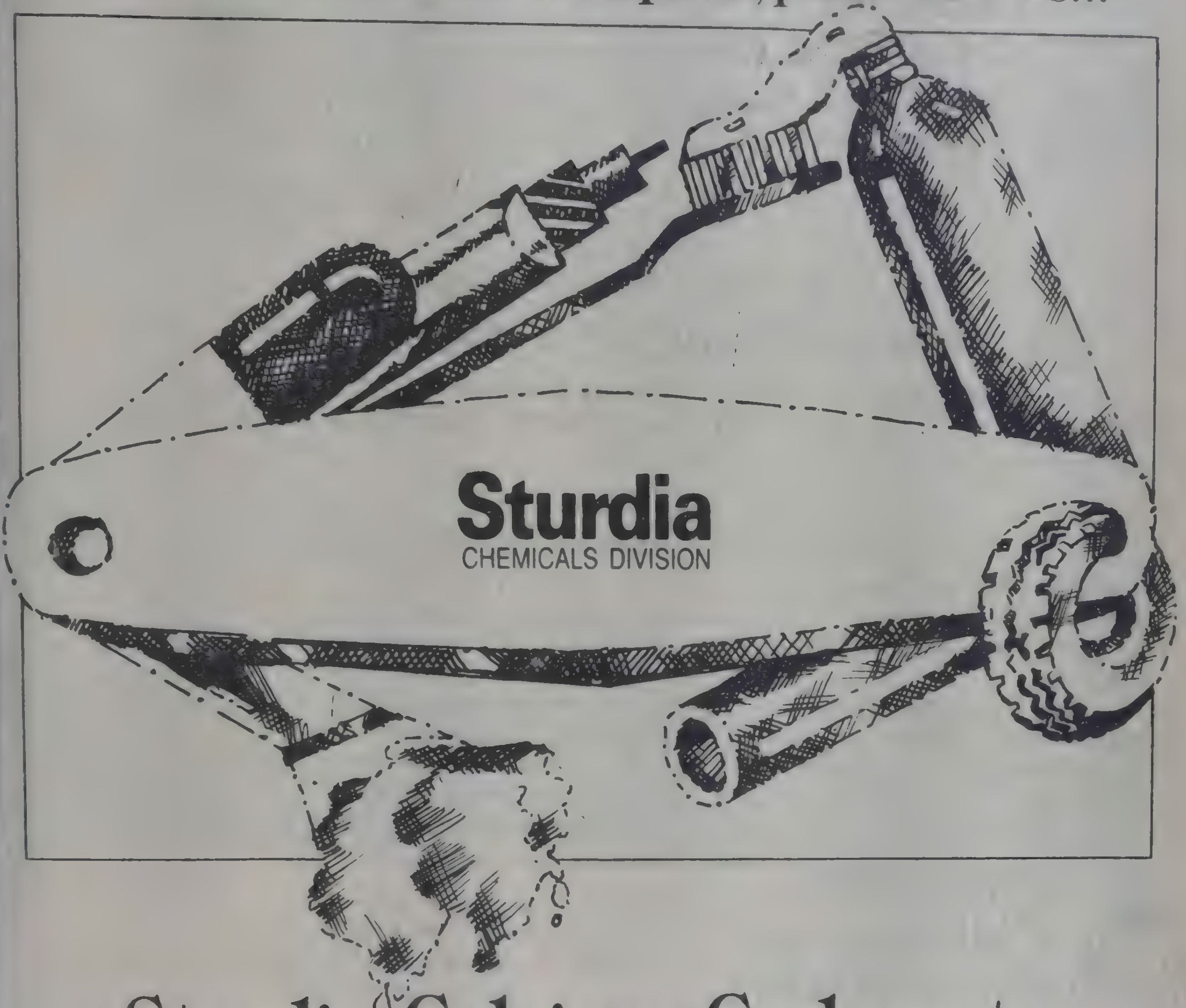
- **CHLOROFORM**
- **ISOPHORONE**
- **LACTIC ACID**
- **PROPIONIC ACID**
- **CELLOSOLVE**
- **CARBITOL**
- **TUNG OIL**
- **SODIUM FORMATE**
- **PROPIONIC ANHYDRIDE**

Contact:

**M/s. PARESH CHEMICAL CORPORATION**

3/25, Steelyard House, 67-F, Sant Tukaram Road, Bombay 400 009.
**Phone: 324500, 325014/5/6/7; Resi: 395245, 378425**

Whether it's tyres or toothpaste, paints or PVC...



Sturdia Calcium Carbonate
Quality is our cutting edge

Leading names in the industry will testify to the quality of Sturdia Calcium Carbonate.

As India's largest manufacturer, Sturdia meets the needs of industries ranging from cables, tyres, PVC pipes, rubber goods and paints to toothpaste, drugs, cosmetics and printing inks. The list continues to grow.

Sturdia has now introduced a new grade-Forcal 'C' which is being extensively used in the manufacture of rigid PVC pipes

**Sturdia**
CHEMICALS DIVISION

CITURGIA BIOCHEMICALS
LIMITED
Regd. Off: Neville House, J.N. Heredia Marg,
Ballard Estate, Bombay 400 038. Tel: 2618071.
Gms: CITURGIA, BOMBAY.

Tlx : 11-73372 BDM IN

Seasons A A/CB/286 R

We Offer Best Quality at Competitive Rates:

- * ZINC DUST (100, 200 & 300 Mesh)
- * ZINC CHLORIDE (Solid & Powder)
- * ZINC OXIDE (Off Grade)
- * ZINC CARBONATE
- * ZINC HYDROXIDE
- * ZINC ASH
- * BRASS ASH
- * ZINC SULPHATE (Tech. & Monohydrate)

Please Contact
Mr. ABHAY M. SHAH - PROP.

**SACHIN CHEMICAL CORPORATION**

9, Shree Balkrishna Chambers, 1/4, Issaji Street, 1st Floor, Bombay 400 003.
Phones: Office: 343234, C/o. 322229 Resi.: 8558912, C/o. 8550414 Gram: "ARUNBRO"

---

For Your Requirements Of:

**Tin Salts/Phosphates/Acetates**

STANNOUS (TIN) CHLORIDE
STANNIC (TIN) CHLORIDE
STANNOUS (TIN) SULPHATE (ACID TIN PLATING)
STANNOUS (TIN) OXIDE
STANNIC (TIN) OXIDE
SODIUM STANNATE (ALKALINE TIN PLATING)
POTASSIUM STANNATE
TIN METAL/POWDER
NICKEL SULPHATE
SODIUM ACETATE (CRY & ANHY)
SODIUM SULPHITE
SODIUM BISULPHITE
SODIUM META BISULPHITE
DIAMMONIUM PHOSPHATE
MONO POTASSIUM PHOSPHATE
DI/MONO/TRI SODIUM PHOSPHATE

Please Contact Manufacturers:

PARAGON

**PARAGON CHEMICAL INDUSTRIES**

6, A G.I.D.C., Behrampura,
Pirana Road, Ahmedabad-380 022.
Tele. No. (F) 393245; (O) 381356
(R) 441525/462302

KNS.AD

---

ZINC CHLORIDE

SNOW-WHITE

**CALCIUM CHLORIDE**

Manufacturers:

**muby chemicals**

23, Maheboob Mansion, 2nd Floor,
2nd Principal S.H. Marg, Chinch Bunder,
Bombay 400 009.
TEL: (O) 869610, 8723564 (R) 8511990 (F) AMBARNATH 2716

Connected to one of the oldest industries in the world, which incidentally is also the youngest.

From ancient garments made of bark and hide, through historical finds of Chinese silk and Egyptian cotton at burial sites, to modern fabrics made on computerized looms, humankind's relations with clothes are as old as civilization. From the time when lamp-black, powdered lapis lazuli, red ochre, dye secretions of the banded murex snail, indigo and other plant, mineral and animal dyes have been used, human facination with colouring agents is also well known.
We at Texchem continue this oddyssey, this quest for cloth and its colour.

Process chemicals for the textile industry for Sizing, Desizing, Scouring, Mercerising, Dyeing, Printing and Finishing.

TEXCHEM®

TEXCHEM®

132, Dr. Annie Besant Road, Bombay-400 018
Phone: 493 6041, 493 38 18, 493 5482.
Grams: 'Thinogum'. Telex: 75648.

a M.G. Saraf Enterprise
Most trusted name in chemicals.

FOR YOUR REGULAR REQUIREMENTS OF:

**HYDROGEN PEROXIDE 50%**

Manufactured by: **M/s. NATIONAL PEROXIDE LTD.**

Contact Authorised Stockist

**V.K. ENTERPRISE**

233/35, Samuel Street, 18, Bhatia Nivas, Vadgadi, Bombay 400 003.
**Phones: Office: 341938/348124 Resi.: 6363983**

For Your Requirements of:

- * BENZENE
- * TOLUENE
- * XYLENE (Ortho/Mix)
- * D.E.G.
- * M.E.G.
- * SOLVENT CIX
- * ACETONITRILE
- * ACRYLONITRILE
- * BUTYL ACRYLATE
- * METHYL ACRYLATE
- * ETHYL ACRYLATE
- * STYRENE MONOMER
  REACTIVE/DIRECT DYES
- * BINDER (Textile/Leather)
- * PIGMENT EMULSIONS
- * TEXTILE OILS (Antistatic-Coning/Warping etc.)
- * CATIONIC SOFTENERS
- * ACRYLIC SIZE

Please write to:

**PARIMAL TEXTILE WORKS**

48, Gokhale Road (South), Dadar, Bombay 400 028.
**Phone: 4225276**

EXCEL

AVAILABLE EX-STOCK

**DIETHYL OXALATE**
**OXALIC ACID**

PGPL

**Phosphoric Acid**
**Phosphorous Acid**
**Vanadium Pentoxide**
**Sodium Nitrite**
**Thionyl Chloride**

**Phosphorous White/Red**
**Ammonium Metavanadate**
**Phosphorous Pentoxide**
**Trichloride/Oxychloride**

Please Contact:

**ALKA SALES CORPORATION**

Nanabhai Mansion, Sir P.M. Road, Fort, Bombay 400 001.
**Tel.: 2864773-2860661-2860390** **Grams: BRAJI** **Telex: 83168 DOSA-IN**

*Available in Bulk Quantity and ready stock*

**FRUSEMIDE I.P./B.P.**
**FENBENDAZOLE**
**C.P. MALEATE**
**DIMETHYL AMINO ETHYL CHLORIDE HCL**
**MEBENDAZOLE U.S.P.-22**
**MEBENDAZOLE U.S.P.-22** (White)
**RIFAMPICIN**
**ALBENDAZOLE**
**FLUBENDAZOLE**
**DIMETRIDAZOLE (VET)** (for export)

WANTED LOCAL AGENTS/STOCKISTS IN UNREPRESENTED AREAS

**TRANSCHEM PVT. LTD.**
56, Ridge Road, Malbar Hill, BOMBAY 400 006.
Phone: 8123636 - 8128608 - 8117511 - 8113334

TRADE ENQUIRY SOLICITED IN TANKER LOAD ONLY FOR
FOLLOWING QUALITY PRODUCTS ON LONG TERM AND REGULAR BASIS

**SULPHURIC ACID 98%** COMM. GRADE

**SULPHURIC ACID** BATTERY GRADE (CONCENTRATED

Contact:

**TARAPUR ACID & ALKALI PVT. LTD.**

*OFFICE:*
15, Amrit Keshav Nayak Marg, 3rd Floor
Near New Empire Cinema,
Fort, BOMBAY - 400 001
**Tel. No. 2046979/2040266/2048850/2044228**
**Gram: 'YELLOWGOLD'**
**Telex: 011-84569 GOLD IN**

*FACTORY:*
Post Box No. 2, Plot No. D-22,
Tarapur Industrial Area, M.I.D.C.,
Boisar, Dist. THANE - 401 506
**Tel. No. 2550/2551/2553**
**Cables: 'CHEMICALS' Boisar**
**Telex: 0132-215 ACID IN**

AVAILABLE IN BULK QUANTITY AND READY STOCKS

**POLYNOL-205**
(against Unitika UP-050-G)
For 'O' Filament Sizing Yarn
**POLYNOL - 117**
(against PVA-173 & BF-17)
**POLYNOL-217**
**POLYNOL-224**
(against GH-17 & BP-20)
**VINYL ACETATE MONOMER**
**STYRENE MONOMER**
**AUTHORISED DISTRIBUTOR**
**FOR POLYCHEM LTD.**

CHECK OUR OFFER BEFORE YOU BUY

**BALAJI POLYMERS**

B/1 MILIND PARK,
OPP. ST. XAVIER'S HIGH SCHOOL
BUS STOP, MEMNAGAR ROAD,
AHMEDABAD-380 052. (INDIA)
PH : 485100/490084

TLX 121 6196 MPC IN
GRAM - POLYNOL

ESTABLISHED 1968
NO COMPROMISE ON QUALITY WITH
BHAVNA'S

**SILICAGEL** (Indicating & Non-indicating Type)
Column Chromatography
Thin LAYER Chromatography

MANUFACTURED BY
**Bhavna Chemical Industries**
51, Vithal Udyog Nagar, Vallabhvidhyanagar, Gujarat 388 121.
Tel. No. Fact: 30243 Resi: 30712 Bombay Contact Tel No: 507507
VALLABHVIDHYANAGAR STD CODE NO.: 02692

ADVT/4

**BASF**
**your partner**
**for progress**

**Offers**
**FROM THEIR RANGE OF APPROX. 6000 PRODUCTS**

- **INTERMEDIATES:**
  - Pivaloyl Chloride
  - Poly Tetrahydrofuran
  - Propargyl Alcohol
  - Propionic Acid
  - Propionic Aldehyde
  - Sodium Methoxide
  - Tributylamine
  - Tri Ethylamine
  - Tri-N-Propylamine
  - THEIC
  - 2,6-Xylidine
- **SOLVENTS :**
  - Dimethyl Acetamide
  - Dimethyl Formamide
  - Dioxane
  - Formamide
  - Tetrahydrofuran
  - Triphenyl Phosphine
- **SPECIALITY CHEMICALS/TABLETTING-AIDS :**
  - Kollidon®
  - Polyvinyl Pyrrolidones
  - Emulsifiers, Solubilizers & Quarternary Compounds
  - PVP-Iodine
  - Pluronic® (Block Copolymers)
- **VITAMINS FOR PHARMA & FEED INDUSTRIES :**
  - Vitamin A, E
  - Vitamins B1, B2, B6
  - Calcium D Pantothenate
  - D-Panthenol

**AND MANY MORE**
For direct imports against OGL/valid import licences,
**Please Contact:**

**BASF India Limited**
Maybaker House,
Sudam Kalu Ahire Marg
P.O. Box 19108
Bombay-400 025.
Phone 493 0703
Grams Basfindia
Telex 1171538 BASF IN

**Branch Offices:**
Karaka Bldg No. 1, Ashram Road,
Nawrangpura, Ahmedabad-380 009
Tel . 407074
Telex: 121-237 BASF IN

Garuda Bldg 46 Cathedral Road,
Madras-600 086
Tel 473561/3563/ 5956/7608
Telex: 41-7822 BASF IN

13 A, Government Place, East,
Calcutta-700 069
Tel.: 233898/3928/5869/3883
Telex: 21-7044 BASF IN

7, Basant Lok Vasant Vihar,
New Delhi-110 007
Tel 3313118/3119/3110
Telex 31-62063 BASF IN

**BASF**

Readily Available Alongwith Excise Gate Pass

**POVIDONE IODINE U.S.P** * **DICYCLOMINE HCl**

TRIMETHOPRIM I.P.
SULPHAMETHOXAZOLE I.P.
ETHAMBUTOL HCl I.P.
ASPIRIN I.P.
IBUPROFEN I.P.
PARACETAMOL I.P.
DIAZEPAM I.P. / ANALGIN I.P.
ERYTHROMYCIN ESTOLATE I.P.
ERYTHROMYCIN STEARATE I.P.
CHLORAMPHENICOL PALMITATE I.P.
PYRAZINAMIDE
NIFEDIPINE
AMOXYCILLIN I.P.
AMPICILLIN I.P.
DILOXANIDE FUROATE I.P.
GUANIDINE NITRATE

PLEASE CONTACT:

**SHILPA TRADING PVT. LTD.**

*Regd. Office:* Rahimtoola House, 7, Homji Street, Bombay 400 001.
**Tel. No.: 2864132/255867** **Resi.: 6121334** **Cable: 'SHILPADRUG'**

For Your Requirements of:

**1. Manganese Sulphate Monohydrate**
Technical, Feed and Fertilizer Grade
**2. Manganese Carbonate**
**3. Zinc Sulphate**
Fertiliser, Feed Grade

Please Contact Manufacturers:

**LAKSHMAN CHEMICALS (DAVANGERE) PRIVATE LIMITED**

Post Box No. 233, DAVANGERE - 577 002.
**Phone No. Off. 3080; Fact. 3359; Resi: 6359.**

AVAILABLE REGULARLY

**ALUMINIUM STEARATE * ZINC STEARATE * LEAD STEARATE**
**T.B.L.S. D.B.L.S.**
**C.P.W., D.O.P., TOLUENE, ORTHOXYLENE, MEK,**
**PROPYLENE GLYCOL/DOW/ARCO/JAPAN, I.P.A., MIX. XYLENE, ACETONE, GILSONITE, P.G. RED OXIDE, SOYALECITHIN, CARBON BLACK, DEG REFILE, 2B WHITENER, COTTON, SYNTHETIC PLASTIC WHITENER FOR LD/HD/PP/PVC/ACRYLICS. VERGINE, TITANIUM DIOXIDE, PHOSPHORIC ACID 85%, JSR RUBBER, KEMLOP, A. WAX, 4202 JAPAN, E 114, STEARIC ACID.**

Contact:

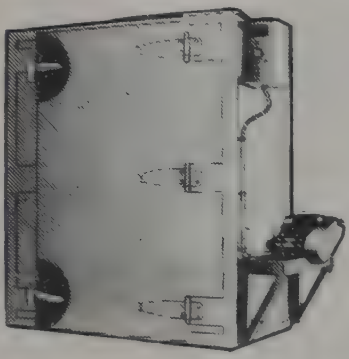
**UNIQUE ENTERPRISES**

503, Bharuch Sadan, Iron Market, Devji Ratanshi Marg, Bombay 400 009.
**Telephone: Office: 331475/344445 Residence: 6062955**

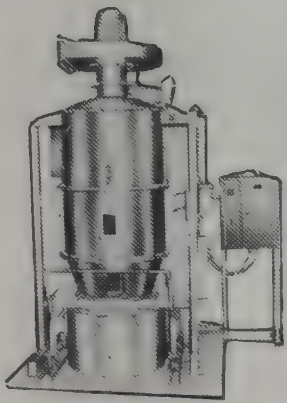
REGULAR REQUIREMENT COPPER WASTE IN ANY FORM OXIDE/DUST/ASH. WE REQUIRE CHEMIST IN RUBBER ADHESIVE

GROVERS

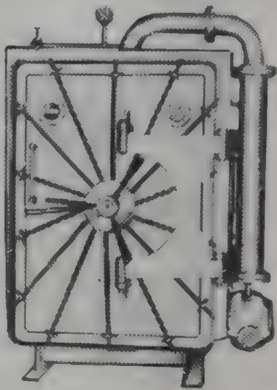
TRAY DRYERS



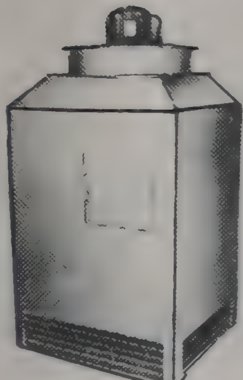
FLUID BED DRYERS



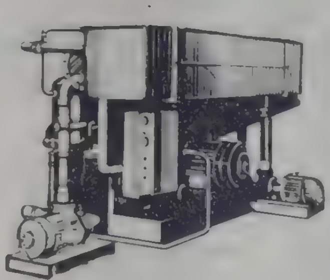
VACUUM DRYERS



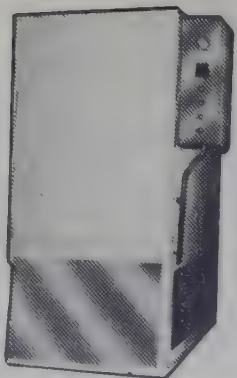
COOLING TOWERS



BRINE/WATER CHILLING PLANTS



FLUID HEATERS



Better design, superior components, totally reliable performance – the hall mark of Grovers

*service to the industry since 1947*

GROVERS PRIVATE LIMITED

228, Kaliandas Udyog Bhavan, Near Century Bazar, Bombay – 400 025. INDIA
PHONES : 4303223/4309935/4309467. TELEX : 71672 CABLE : GROFROST

Available Regularly at Competitive Rates Ex-Stock/Ex-Factory

**SODIUM NITRITE * SODIUM NITRATE**

Mfrd. by: M/s. SONIL Div. of M/s. CHEMCROWN (INDIA) LTD.

| | |
|---|---|
| RIFAMPICIN I.P. (COMPACTED) | 2-AMINO-4,6-DICHLORO PHENOL HCL (ACPH |
| IBUPROFEN I.P. | 2-AMINO-4-CHLORO PHENOL |
| PHENOBARBITONE I.P. | OCTYL ACETATE |

Mfrd. by: M/s. CUREKRAFT CHEMICALS (I) PVT. LTD. Divn. of M/s. CHEMCROWN (I) LTD.

**PARA TERTIARY BUTYL PHENOL -- PTBP**
**DITERTIARY BUTYL PARA CRESOL -- DBPC (BHT)**

Indenting Agent of M/s. Balmer Lawrie & Co.

Please Contact:

**CHEMCROWN INDIA LTD.**
D/3, Poonam Apartments, Dr. A.B. Road, Worli, Bombay 400 018.
Phone: 4928386/4928737 * Telex: 011-71758 CHEM IN

CALCUTTA OFFICE: 295652/290218 * DELHI OFFICE: 3317051/3316666 * KANPUR OFFICE: 211641/211825 * MIRZAPUR OFFICE: 3

FOR YOUR REGULAR REQUIREMENT OF:

| | |
|---|---|
| ACETYL CHLORIDE | CHLOROACETYL CHLORIDE |
| BENZOYL CHLORIDE | BENZOTRICHLORIDE |
| BENZOYL PEROXIDE | BENZYL CHLORIDE |

**BENZOIC ACID**

Please Contact Manufacturers:

**Shree ORGANIC CHEMICALS**

184, Samuel Street, 21 'A' Mandvi Chambers, 2nd Floor, Bombay 400 003.
Phone: Off: 345418 / 332659
Phone: Plant: LOTE. 256

**NOBLE Packo-Chems**

**HEAD OFFICE:**
17, Venkataroyen Lane,
P.B. No. 2315,
MADRAS 600 003.
Phones: 585840/586553
Grams: 'PACKOKEMS'

SOLVENTS OUR BUSINESS

**WORKS:**
Madhavaram,
MADRAS-600 060.

ACETONE, ACETIC ACID, BENZENE, BUTANOL, BUTYL ACETATE, BENZYL ALCOHOL, BENZYL ACETATE, CARBITOL, CELLOSOLVE, CHLOROFORM, C.T.C., CYCLO HEXANONE, DIACETONE, D.B.P., D.E.P., D.O.P., D.M.P., D.E.G., ETHYL ACETATE, ETHER PET., FORMALDEHYDE, ISO-PROPANOL (I.P.A.), M.E.K., M.I.B.K., M.E.G., PROPYLENE GLYCOL, TOLUENE, TRICHLOROETHYLENE Etc.

For all your requirements in any packing
contact the PREMIER HOUSE OF SOLVENTS

# SARNA

# CHEMICALS PVT. LTD.

*OFFICE :*

1, Nirmal, Plot No. 147, G.I.D.C., VAPI

*WORKS :*

805/3, Phase III, G.I.D.C., VAPI

**Phone : VAPI M.S.T.D. CODE 0263812**

**O. 836 R. 1604**

*Manufacturers of*

# META CHLORO ANILINE (M.C.A.)

**CREAM OF TARTAR LR/AR**
(Potassium Bi-Tartarate)
**ANTIMONY POTASSIUM TARTARATE LR/AR**
**ROCHALLE SALT**
(Potassium Sodium Tartarate)
**SODIUM TARTARATE LR/AR**
**TARTARIC ACID (99 & 99.5%)**

Please Contact:

**NATIONAL CHEMICAL INDUSTRIES**
*Factory:* Plot No. W-43, M.I.D.C. Industrial Estate, Morivli, Ambernath, Maharashtra 421 501
*Office:* 12, Bharat Mahal, 3rd Floor, Thane (East), Maharashtra 400 603. **Phone: 507267/594898**

**We Offer Best Quality at Competitive Rates:**

**ACID SLURRY - SOFT/HARD**

MANUFACTURERS:

**Gala Chemicals**

*Admn. Office:*
C/34, Adke Compound, Surya Nagar Road, Vikhroli (W),
Bombay 400 083.
**Tel. No. 583276, 587361**

MANGANESE SULPHATE -- 98%
**MONO HYDRATE**
($MnSO_4 . H_2O$) --- Mn 32%

MANUFACTURERS

**KUM INDUSTRIES**

1009/2, VINOD BUILDING,
DEEP BUNGALOW CHOWK, PUNE - 411 016
PHONE: OFFICE: 53129 FACTORY: 84874

ROHAN DYES AND INTERMEDIATES
(AHMEDABAD)
FOR YOUR REQUIREMENTS AS PER INTERNATIONAL STANDARD TOP IN QUALITY

- GAMMA ACID
- G. SALT
- R. SALT
- META UREIDO ANILINE HCL
- K. ACID
- AMIDO G. SALT
- S.P.C.P.
- S.P.M.P
- 2.5 DICHLORO S.P.M. P.
- P.M. P.
- SULFANILIC ACID (TECH. GRADE)
- SULFANILIC ACID (PURIFIED)
- SCHAFFER'S ACID
- 4-NAP
- 4-NAPSA

AND SHORTLY INTRODUCING MANY NEW ITEMS & A RANGE OF DIRECT, ACID AND REACTIVE DYES

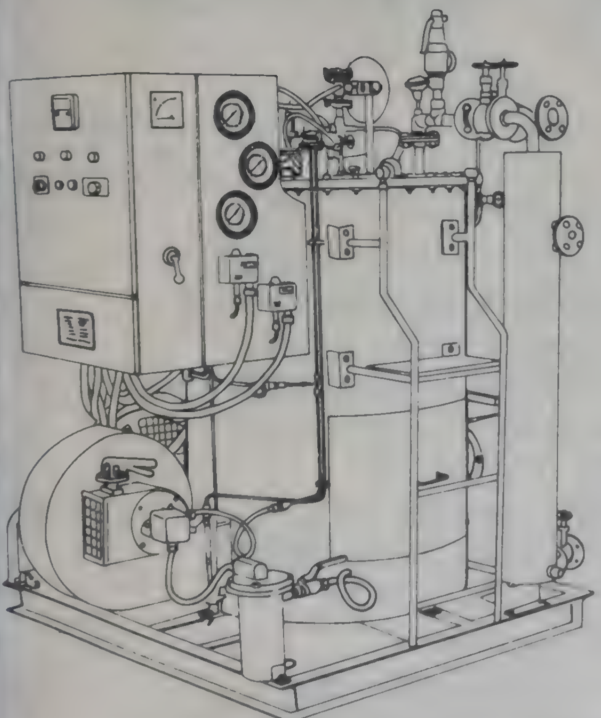
ROHAN DYES & INTERMEDIATES

OFFICE :
189, NEW CLOTH MARKET,
AHMEDABAD-380002.
PH. : 368171 & 360758, FAX : 272-346412
TELEX : 1216942 JITM IN

BOMBAY OFFICE :
2ND FLOOR, PUSHPAWATI BLDG. NO. 2,
CHANDANWADI, GIRGAON ROAD,
BOMBAY-400002.
TEL. 256740 , 298224 TLX : 01182383

FACTORY :
115, GIDC, PHASE I, VATVA,
AHMEDABAD-380045.
PH. : 831131-2, 833771 & 834469

DISTRIBUTOR :
RONAK ENTERPRISES
B/2, RAJDEEP PARK FLATS,
BALIAKAKA RD., AHMEDABAD.
TEL. : 396719 & 395475.



FULLY AUTOMATIC PACKAGE STEAM BOILER

RANGE : 100-1500 kg/hr
- Three pass Oil/Gas fired
- High efficiency 80 ± 2 % On NCV ● Compact design
- Instant steam ● Fully Automatic Operation
- Pressure parts consisting of coil made from Seamless pipes.

Our other products :
- Thermic Fluid Heaters
- Hot Air Generators
- Water Ring Vaccum Pumps
- Centrifugal Air Blowers

aeromatic
ENGINEERING COMPANY

Near Gujarat Bottling, Rakhial,
Ahmedabad - 380 023. Phone : 364669, 363158
Gram : AEROMATIC Telex : 0121-6291 AERO IN

Sterling

PETROLEUM BENZINE (PETROLEUM ETHER)
40°-60°/60°-80°/60°-95°/80°-100°/80°-120°/90°-100°/100°-120°
HEXANE 65°-70° EMULSIFYING WAX

* *

AROMATIC CHEMICALS

* *

AMYL BUTYRATE ETHYL BUTYRATE BUTYL BUTYRATE
ISO BUTYL BUTYRATE ISO AMYL ACETATE AMYL PROPIONATE ETHYL PROPIONA
SCHAEFFER'S ACID (AS SODIUM SALT) (Export Enquiries Solicited)

Contact Manufacturers

**STERLING ORGO & INORGO CHEMICALS P. LTD.**

**Regd. Office:** 340/42, Samuel Street, Raut Chamber, 4th Floor, Bombay 400 003.
**Phones: 333601/333602/338722 Telex: ASIM IN 73145 Fax: 331738**
**Factory:** Plot AF-1, Cama Industrial Estate, Walbhat Road, Goregaon (East), Bombay 400 063.
**Phone: 6730458/6734593/6734650 Resi.: 352625/364354/8114061**

---

**M.D.I. (Diphenyl Methane Di Isocyanate PAPI-27) (DOW, U.S.A.)**

**HYDROXY ETHYL CELLULOSE (LR/GR) * H.P.M.C. ALL GRADE**
**SYNTHETIC ACRYLIC RESIN 50% (I.C.I. U.K.) (For Paint or Ink)**
**FORMOSUL (U.K.) (Against Rangolite-DS) (Imported)**
**BETA NAPHTHALENE SULPHONIC ACID (HICO)**
**UVTEX (Optical Whitening Agent for Plastic Industries) (Imported)**
**PARA NITRO ACETOPHENONE * METHYL CELLULOSE ALL GRADE**
**EPOXY PLASTICIZER (Imported) * P.V.C. (Additives)**

Please Contact:

**AMRIT CHEM**

404, Guru Krupa, 133, Kazi Sayed Street, Bombay 400 003.
**Phone: Office: 335233, 341444; Resi.: 6121976, 6150823 * Telex: 011-73130 SWAMI IN**

---

**For Your Regular Requirements of Following Products:**

**BULK DRUGS:**
- ATENOLOL B.P.
- DIETHYL CARBAMAZINE CITRATE I.P.
- NIFEDIPINE U.S.P.
- THEOPHYLLINE ANHYDROUS I.P.
- PROPONAL HYDRO CHLORIDE I.P.

**DRUG INTERMEDIATES:**
- ORTHO NITRO BENZALDEHYDE
- 8-CHLORO THEOPHYLLINE
- NITROMETHANE (FOR RANITIDINE)
- METHYL ISO THIOCYANATE (FOR RANITIDINE)
- 1-METHYL AMINO 1-METHYL THIO 2-NITRO ETHANE (FOR RANITIDINE)
- 2,6-DICHLORO ANILINE

Please contact manufacturer:

**TRICHEM LABORATORIES**

Lalwani Industrial Estate, 14, G.D. Ambekar Marg, Wadala, Bombay 400 031.
**Phone: 4123188/4127568 Telex No.: 011-75354 TLB IN**

**KAUSHAL AROMATIC CHEMICALS**

gives you access to the latest technology in

**Setlyte Polyelectrolytes**

**For Flocculation and other uses in industries like:**

- Boiler Feed Water Treatment
- Paper Industry
- Sugar Industry
- Coal Washeries
- Copper Concentrators
- Zinc & Iron Ore Dressing Plants and Beneficiation Plants
- Chemical and Ceramic Industries

For further details please contact:
**KAUSHAL AROMATIC CHEMICALS PVT. LTD.,**
36, M.I.D.C. Area, Hingna, Nagpur 440 028 □ Phone: 7364/7410

AKA/430

**REASONABLE PRICES AND EX-STOCKS**

**EDTA ACID 99 ± 1%**

**LIQUID EDTA (50 C.V. & 100 C.V.)**

**DTPA 99 ± 1%**

**DTPA SOLUTION 40%**

**NITRILO TRI ACETIC ACID (N.T.A.)**

CONTACT
MANUFACTURER

**OM NEELKANTH**
**CHEMICALS INDIA PVT. LTD.**
FACTORY :
S. NO. 204, KARANNAGAR - 382 727
DIST. MEHSANA (N.G.) PHONE : 2129
(KADI - DIRECT DIAL CODE 02769)

OM NEELKANTH
ONC
CHEMICALS

OUR NEW HEAD OFFICE ADDRESS :

5, ANAND CHAMBERS, 2ND FLOOR,
NEAR STATE BANK OF INDIA, OPP. "SHILP",
NAVRANGPURA, AHMEDABAD - 380 009
PHONE : 408360 GRAM : NEELCHEM
TELEX : 121-6539 TRCE IN
ATTN : OM NEELKANTH

FOR YOUR REGULAR REQUIREMENTS AT COMPETITIVE RATE

**SODIUM CHLORITE**

**80% & 50% Also Liquid 25%**

**Packing - 50 Kgs.**

**3,4 D.A.B.P.**

**Manufactured By: M/s. Sumanth Fine Chemicals 6 KIADB, Loki Pvt. Ltd.**
**Kere Road, Dhavangiri, Pin. 577 005.**

Please Contact:

**MEHTA BROTHERS**

160/162, Samuel Street, 1st Floor, Masjid Bunder, Bombay 400 009.
**Phone: 8558881 Resi.: 6140649**

ATTENTION PLEASE: F.R.P. MOULDERS, FABRICATORS AND LINERS

For all your needs in

**POLYESTER RESINS**

Please Contact:

**PLIOGRIP RESINS & CHEMICALS PVT. LTD.**

One of the leading manufacturers of:

G.P. - ISO. Boat Grade, GALCOATS, Fire Retardant, Lamination & Automobile Grades

*Works:*
W/78, Phase II,
Opp. H.M.V., M.I.D.C.,
Dombivli (E), Dist. Thane,
Phone: 5682

*Office:*
96, Narayan Dhuru Street,
2nd Floor,
Bombay 400 003
Phones: 333655 & 346984

*Sales & Enquiries:*
CONTACT OFFICE
or
PHONES
Res. 6340986, 4092960, 4078280

We have EXPORT INQUIRY for following items

- Reactive Black 5,8
- Reactive Blue 21, 19, 71
- Reactive Orange 12, 13, 16
- Reactive Yellow 15, 42
- H-Acid
- Metanilic Acid
- Resist Salt
- R-Salt
- Ibuprofen
- Gamma Acid
- Rhodamine

Manufacturers and Traders who can offer these items at competitive rates may please write to:

**SPECIALITY CHEMICALS**

407, Yogeshwar Building, 135/139, Kazi Sayed Street, Masjid, Bombay 400 003.
Telephone: 336828/344286 Telex: 011-3258 DUCO IN Gram: CHEMILITY

*QUALITY * RELIABILITY * EXCELLENCE*

WE TAKE EXTRA CARE
INDIAN GUM INDUSTRIES LTD

*Available Ex-Stock*

**PROPYLENE GLYCOL USP (DOW)**

**Adipic Acid**
**Methylene Chloride**
**Hydroxyl Amine Sulphate**
**2-Chloro Propionic Acid**

**REQUIRED FOR EXPORT**

**Norfloxacin USP**
**Niacin BP**
**Ibuprofen**
**Schaeffers Acid**
**Pyrantal Pamoate USP**
**6-Nitro-1-Diazo-2-Naphthol-4-Sulphonic Acid**
**(2:5 Dichloro-4-Sulfophenyl)-3-Methyl-5-Pyrazolone)**

**Indian Gum Industries Limited**
(Recognised Export House)
51-A, Maker Chamber IV, Nariman Point, Bombay 400 021
**Telex: 2139 IGUM. Tel: 243711-12-30-60**

ATTENTION MANUFACTURERS OF DYESTUFFS, DYE INTERMEDIATES, BULK DRUGS AND BULK DRUG INTERMEDIATES

Regularly Available on Competitive terms

**ACETANILIDE**
**OF ULTRA PURE QUALITY**

INTRODUCING SHORTLY

ANILINE OIL
N,METHYL,N,HYDROXY ETHYL ANILINE
OXYETHYL NITRO ANILINE
N,N,DIHYDROXY ETHYL META TOLUDENE
N,ETHYL-N-HYDROXY ETHYL ANILINE
N,N,DIHYDROXY ETHYL ANILINE
N,N,DIHYDROXY ETHYL META CHLORO ANILINE

Contact Manufacturers

**VASUDHA CHEMICALS PVT. LTD.**
501, Sai Ashish A-Wing, Balrajeshwar Road, Mulund (W), Bombay 400 080.
Tel: 5604382/5613921 Fax: 91-22-5603680 Tlx: 011-71030 DELT IN

GANESH MEDICAMENT PRIVATE LTD.
manufacturers of
**PHENOBARBITONE I.P**
**PHENOBARBITONE SODIUM I.P.**
FOR BEST QUALITY AT MOST ECONOMICAL RATES
AVAILABLE FROM READY STOCK

**GANESH SYNTHETICS & CHEMICALS**
MANUFACTURERS OF
SODIUM BENZOATE I.P.
BENZOIC ACID I.P.
BENZOATE PLASTICIZER

For Further information please contact
H.O
145-A, Dr. Veigas Street, Kalbadevi Road, Bombay-400 002
Telegram: 'BENZACID' Telex: 011-3906 GNES IN Phones: 317993 • 295476 • 253438 Fax: 2663

Delhi Office: 9, Dewan Hall, 3rd Floor, Bhagirath Palace, Chandni Chowk,
DELHI - 110 006. Phone: 2915309
Calcutta Office: 4, Synagogue Street, 9th Floor, CALCUTTA - 700 001.
Phone: 250790. Gram: 'GLOBALCHEM'

PRINT DESIGN

# Chemical Weekly

VOL. XXXV AUGUST 14, 1990 NO. 49

*Publishers:*
**SEVAK PUBLICATIONS**

*itor - Publisher*
**RAGHAVAN**

*dvertisement Manager*
**R. RAJAGOPALAN**

*dministration/Circulation*
**JAY RAGHAVAN**

*ditorial & Administrative Office:*
06, Shri Hanuman Industrial Estate
.D. Ambekar Road, Wadala,
OMBAY 400 031.
hones: 4120743/4131198
elex: 011-76053 CWLY IN

*adras Office:*
oom No. 9, Wellingdon Estate,
rd Floor, 24, Commander-in-Chief
oad, Madras 600 105.
hone: C/o. 471659
elex: 041-6290 CWLY IN.

*rinted at:*
evak Publications,
5, North Mada St., Thiruvanmiyur,
adras 600 041.

ast Print Service,
07/308, Shri Hanuman Indl. Estate
.D. Ambekar Road, Wadala,
ombay 400 031.

**ubscription Rates:**
**Inclusive of Postage)**
ndia: Rs. 400.00
oreign: US$ 175.00 (Air Mail)
US$ 75.00 (Sea Mail)

***Subscription charges payable in***
***advance in favour of***
***SEVAK PUBLICATIONS***

## CONTENTS

Heralding the 21st Century: The dawn of the natural gas era in the Asia-Pacific region — T.P.S. RAJAN 41
Chemarena — S.L. VENKITESWARAN 43

### IN THE NEWS

Kerala titanium dioxide unit: DCW joins race 46
Safety code soon for chlor-alkali plants 46
Warehousing committee to resume work 48
Dyes, intermediates units: GITCO evolves export promotion programme 49
Fixing fair selling price for paraxylene: BICP exercise ruled out 50
PFY project plan in Bengal being recast 63
TPL detergent project may be set up at Karaikal 64
TPL's LAB complex dedicated to the nation 65
Caprolactam project commissioning: FACT misses deadline again 66
ONGC feedstock for MGCC by month-end 68
Govt. allows DMT, PTA imports against additional licences 84

### PHARMACEUTICAL CAPSULE

'Drug industry pressurising Govt.' 56
Total decontrol of drugs ruled out 56
Unwarranted price controls will ruin drug industry 58
NIN disproves claims on Vitamin A 61

### OIL AND NATURAL GAS SCENARIO

Bijaipur petrochem project cleared 69
Assam gas cracker project: MacNeill & Magor seeks co-promoter status 70
Kandla-Bhatinda controversy ends: Pipeline, railway projects cleared 76
Gurupadaswamy favours more stringent curbs on oil use 78
Petrol, oil import bill to touch Rs. 8,000 crore 80
Petroleum ministry seeks urgent release of forex 81
TN puts up case for gas pipeline for South 82
ONGC measures to cut energy consumption 83
ONGC keen on developing well off Nagapattinam 85
ONGC move to hire drill-ships runs into rough weather 86

### FERTILISER BRIEFINGS

RCF abandons Gulf plan 52
Delay pushes up Kakinada project cost: Nagarjuna Fertilisers seeks new terms of financing 54
Chambal Fertilisers order for L & T 71
FACT improves capacity utilisation 71
Fertiliser units profitability declines 72
Fert. demand in WB yet to pick up 73
RCF ammonia plant modernised 74

### PESTICIDES NEWS

Pesticides registration: Amendment to Insecticides Act to be dropped 75
Pune seminar on herbal pesticide 75

### MINERALS AND METALLURGICAL FRONT

Aluminium use, output on the rise 48
Record Khetri output 87
Zinc, copper prices hiked 87

### ECONOMIC NEWS

Duty drawback rule relaxed 60
Deemed exports to get full CCS 62
Impex code no. norms eased 88
Star houses can transfer special additional licences 88
COMPANY NOTES 89

### REGULAR FEATURES

Highlights in Chemical Technology 95
Science Briefs 103
Materials Management — Part XVI — Packing — N.R. PAI 109
New Products 113
Indian Standards 117

### INTERNATIONAL SPECTRUM

News from Japan 121
New Developments from Japan 123

### MARKET INFORMATION

Bombay Chemicals Market 129
Bombay Dyes Market 134
Delhi Market 136
Madras Market 137
International Bulk Chemical Prices 138
Shipping News 138
Materials Imported/Exported 141

# For your requirements of 'STEARIC ACID'

JOTEX -- FOR STEARATES, CHEMICAL AUXILIARIES AND COSMETICS
JOPLAS -- FOR PLASTICS, PAINTS AND AUXILIARIES
JOSTRIC -- FOR STEARATES, CHEMICALS AND METAL POLISHES
JOCIL-9 -- FOR RUBBER, CEMENT, PAINTS, METAL POLISHES & GREASES
RUBBER GRADE -- FOR RUBBER, BUFFING COMPOUNDS, LUBRICANTS/GREASES

AND OTHER CRUDE/DISTILLED/HYDROGENATED
FATTY ACIDS AS PER CUSTOMERS REQUIREMENTS
ALSO REFINED GLYCERINE AND FATTY ACID PITCHES

PLEASE CONTACT MANUFACTURERS

## M/s. Jayalakshmi Oil & Chemical Industries Ltd.

P.O. Box No. 216, GUNTUR - 522 002
(Andhra Pradesh)

**ALSO AGENTS:**

**(FOR GUJARAT, MAHARASHTRA AND MADHYA PRADESH)**
SHREE CHEM EXPORTS PVT. LTD.
801, Dalamal Tower, Nariman Point, BOMBAY-400 021
Grams: 'ANHYDRIDE'; Telex: 011-5179; Phones: 231308/231336

**(FOR WEST BENGAL, BIHAR AND ASSAM)**
BINAYAK PRASAD PRAKASHCHANDRA
4, Ramkumar Rakhit Lane, CALCUTTA-700 007
Grams: 'SUGDEALERS'; Phones: 39-9268/39-6526

**(FOR DELHI, UTTAR PRADESH, PUNJAB AND HARYANA)**
ELDEE ENTERPRISES
1st Floor, 6692/1, Khari Baoli, DELHI-110 006
Grams: 'PHOSPHATE'; Telex: 031-61139 ALAIN; Phones: 230948/2528100

**(FOR KARNATAKA)**
GEO IND. TRADING CO.
S.L.N. Mahal, 5/1, Link Road, 3rd Cross, Malleswaram, BANGALORE-560 003
Phone: 572661

**(FOR KERALA)**
SAMIRA ENTERPRISES
Ancherial Bldg., Village Office Road, Kottayam 686 001.
Phones: 2834/2835

CHEMICAL
WEEKLY

VOL. XXXV AUGUST 14, 1990 NO. 49

## HERALDING THE 21st CENTURY - 63

# The dawn of the Natural Gas era in the Asia Pacific Recion

atural gas development in the Asia Pacific region has been gathering momentum and there is no doubt that the 0s "new natural gas era" for the Asia-Pacific region. pressed in terms of oil equivalency, the 35 billion barrels proven natural gas reserves in the Asia-Pacific region far pass the 15 billion barrels of known oil reserves.

On top of this, growth in volume of proven reserves in same region has also far outstripped that of the world rage in recent years, suggesting that enormous hidden ential still remains to be discovered.

Under the right conditions, supply and demand tor nat- l gas energy sources can be increased dramatically over t a short period of time. The nincties is likely to see a sub- ntial development in the utilisation of natural gas in the a-Pacific region.

n 1978, the annual demand for natural gas in the Asia- cific region amounted to 45,100 mcm. By 1988 this figure l increased 2.3-fold to 102,500 mcm. Since the increase primary energy consumption during this period was about -fold, we can see what an enormous leap forward natural made over that period. However, natural gas still ounted for only 6 per cent of the total primary energy uirement in the Asia-Pacific market in 1988, as compared h 20 per cent in the world as a whole. This fact shows re is still great room for further expansion of natural gas.

**angladesh:** Bangladesh, though comparatively a small intry, has vast deposits of gas and it has just struck oil small quantities. As many as 100 gas fields have been ated and the potentialities of each has been evaluated. Of se only four fields namely Eppatah, Sylhet, Haliganj and as are being exploited to meet the current demand. The naining stand untapped for the present. Besides gas, the r gas fields between them yield 11,500 tonnes of con- sate annually which is being used as high octane auto fuel.

**urma:** Burma's estimates of onshore gas reserves vary m one to two million M$^3$ mostly lying in the Irrawadys lta area while other areas are already being exploited ther up the course of the famous river at Proma, Chauk and Mann. Recent seismic work by the Japanese geologists looking for oil reserves in Burma has confirmed the reserve of gas bearing structures.

The top priority gas project in Burma is the 260 mile gas pipeline project from Kyaiklat in the Irrawadys Delta region to Rangoon and then in the city of Moulmein on the eastern sea board which aims at the substitution of oil by gas.

Gas is already being used at Kyailkat as a fuel for the Iwanma power station near Rangoon.

Burma has huge proven gas reserves in the Martiban offshore gas field southwest of Rangoon. The Burmese Government after more than 3 years of sustained effort to raise foreign financing for this project, suddenly decided to defer this estimated US one billion dollar project and concentrate on the smaller offshore reserves. The main reason for the change in decision is reported to be the fall in price of oil and the fear of further increase in the already increasing national foreign debt burden. The plans for the development of the offshore reserve envisage a giant methanol-urea-ammonia complex and depending on the international financial scenario, it is most likely to be revived in the immediate future.

**Thailand:** It is just a decade since offshore natural gas was discovered in the Gulf of Thailand. Thailand has ambitious schemes on hand to make the most efficient use of its oil and gas reserves before the turn of the century. Power generation has remained until recently the main spur for almost all gas production development. Over 70% of Thailand's 11 million M$^3$/day of non-associated natural gas is used in the Bangkok Power Station. The recent plants at Statur, 110 km. north of Bangkok are the other major consumers.

Thailand's proven natural gas reserves stand at about six billion cubic feet, most being offshore in the Gulf of Thailand. Estimated reserves are about 16 billion cubic feet. Thailand's gas production capacity is only 11 billion. Thailand initiated production of natural gas in 1981. Consumption has steeply increased since then, and today natural gas meets around 18 per cent of the countries total energy requirements. Production volumes are expected to increase to about two times the current levels before 2000, thereby contributing to reductions in oil imports. Substantially increased amounts are expected to be supplied not only to the electric power generation, cement production and lpg extraction industries, but also to the petrochemical, fertilizer and other industries, which are centred mainly in the coastal industrial zones. Lng export to Japan is also under consideration.

**Malaysia:** Malaysia, trying to conserve its petroleum resources, is keen to develop its natural gas reserves which surpass the country's oil reserves by a factor of three and which meet one-quarter of the domestic energy market. The goal is to expand the domestic demand by about 7 per cent a year through to the year 2000. The key to the success of this policy is the construction of a gas pipeline down the Malay peninsula which can meet Singapore's gas needs. Malaysia also supplies six million tons of lng per year to Japan and is planning to increase this amount. Synthesis from natural gas to middle distillate is also under consideration.

**Singapore:** After five years of letting bottled gas supplies meet the growing needs of residential users, Singapore's public utility board is preparing to reenter the city gas market and expects to increase its customers by more than double over the next five years. The Singapore Government and Indonesia's National Oil and Gas Corporation have been involved in talks covering technical aspects of offshore natural gas. The Government plans to acquire natural gas purchase rights from Malaysia for 20 years as also the import of Indonesia off shore gas for an indefinite period.

**Hongkong:** In just about 10 years, the number of Hongkong Gas Companies has increased from a modest 60,000 to nearly half a million and sales are expected to increase in double figures for the rest of the decade atleast. Although the prospect of abundant supplies of natural gas from China is an expensive one, the company, for obvious reasons, is building reserve gas generation capacity based on naphtha. The possibility of Hongkong Gas Company receiving piped natural gas are rated quite high. The initiative in this case has come from the Chinese Offshore Natural Gas Corporation and its subsidiary, China Offshore Gas Wholesalets Corporation. Currently the transmission pipelines of Hongkong are being laid taking this project considerations into Indonesia.

**Korea:** Korea started importing lng from Indonesia in 1986 under a contract for two million tons per year. Some 90 per cent of this total is presently used for electric power generation. There is a strong likelihood that the import will be raised to around six million tons by the year 2000.

Imported lng is now sent by pipeline from the port of Pycongtaeg to Seoul, where it is used as a raw material by the city gas companies, but it is expected that the pipeline will be extended to Pusan and Gwangju with new terminals near Inchon and in the south in and after the mid-1990s. The volume of natural gas used by the city gas companies will become more or less even with that used by the electric power companies by the turn of this century.

**Brunei:** Brunei is the second lng exporter on the Pacific rim after the USA (Alaska), shipping 5,140,000 tons to Japan annually. Domestic gas consumption is about 2 bcm a year. The gas is used in the power sector, where it occupies mo than 90 per cent of power generation.

**China:** As a source of primary energy natural gas accou for only 2 per cent of China's total requirements. China h rich underground reserves estimated at several tcm, but the are not currently being exploited owing to the difficulty access of both the deep inner onshore and offshore deposi Some progress has been made, however, in introducing na ural gas to Beijing's city gas utility, using a field located rel tively close to the city. The natural gas reserves off Hain Island are to be used as fuel for thermoelectric power plan and as raw materials in the manufacture of fertilizers. The is also a plan for converting natural gas to lng for expo

**Taiwan:** Although domestic natural gas production is the decline, Taiwan's economy continues to be very activ As part of the country's overall energy programme, constru tion of facilities is expected to be completed early this ye to permit the import of around 1.5 million tons of natur gas per year from Indonesia. The imported gas is to be us to generate electric power and to supply city gas requir ments. The quantity of gas imports could well rise to the 1 million ton mark in the future.

**Philippines:** The Philippines, endowed with virtually natural gas reserves, also shows some interest in the use natural gas, but there are at present no specific plans to beg import.

**New Zealand:** New Zealand's onshore and offshore ga fields came on line during the 1970s and natural gas no accounts for a 17 per cent share of the market. The domest demand is expected to grow at an average rate of about 1. per cent a year from 1983 up to the year 2000. A strikin feature of New Zealand's natural gas market is that natura gas is being used in place of gasoline as automobile fuel a rate of about 1,600 t/d. Lng for cars is available at mor than 300 service stations. Potential export of lng to Japan also currently under consideration.

**Australia:** Australia has confirmed natural gas reserve sufficient to meet its needs well into the 21st century, bu the length of the supply lines required to bring these natura gas supplies to within reach of the consumer is an ongoin problem. The only solution to this imbalance would seem be the construction of a massive network of pipelines acros the continent. Natural gas accounted for about 16 per cen of the market in 1988, and this share is expected to expan steadily at about 2 per cent annually until the year 2000. Las summer saw the inauguration of an lng export project deliver 5,810,000 tons of lng to Japan annually.

**Japan:** Japan accounts for 42 per cent of the demand fo natural gas in the Asia-Pacific region and around 69 per cen of the world's lng trade. In fiscal 1988, Japan imported 31.3 million tons of lng. If the small amount of domestic production is also taken into account, natural gas had a 9.6 per cen share of Japan's primary energy market. The supply an demand situation surrounding natural gas in the year 200 will depend on a large number of variables. There seems be strong possibility that the year 2000 will see som improvement over MITI's last estimate in 1987 of 88 million tons of lng in the same year.

(To be concluded

— T.P.S. RAJA

# CHEMARENA

**S. L. Venkiteswaran**

## PTA in the Asian Region

With the present programmes that are announced or already under implementation the Far East will become the largest producer of PTA in the near feature. The Asian demand is estimated to be 3.5 million tonnes presently going up to 4.8 by 1995. Significantly, all new capacity for this polyester fibre intermediate is for PTA and none for DMT -- which India should take note of and avoid attempts to prop up DMT production through the mechanism of price regulations. India cannot afford to dither over the final clearance of the two other PTA projects -- one in Manali, Tamilnadu and the other at Saleempur and the associated paraxylene production.

There are five plants to be ready this year, three of them in Korea each of 1,50,000 to 2,50,000 tonnes capacity. Taiwan is expected to have three plants before 1991 -- Capco with 2,50,000 TPA; FCFE with 2,00,000 TPA and ICI with 3,50,000 TPA. Indonesia's Pertamina has also taken up work on a 2,50,000 TPA project while Thailand will soon proceed on a 2,25,000 TPA plant with the association of ICI. Taiwan is to take up another 2,80,000 TPA plant in 1992-93 and China is to start up a 2,20,000 TPA plant. All the major world producers are in line with ICI/Amoco taking the lead and Mitsubishi/Mitsui Petrochemicals expanding both in Japan and in the South/Far East region with their associate companies.

Polyester is the fibre with maximum preference both as staple fibre and yarn. India has the greatly increased production of cotton but even so polyester has a big role to play if the production of feedstock and intermediates is adequate and at fair prices and there is a rational and positive taxation policy.

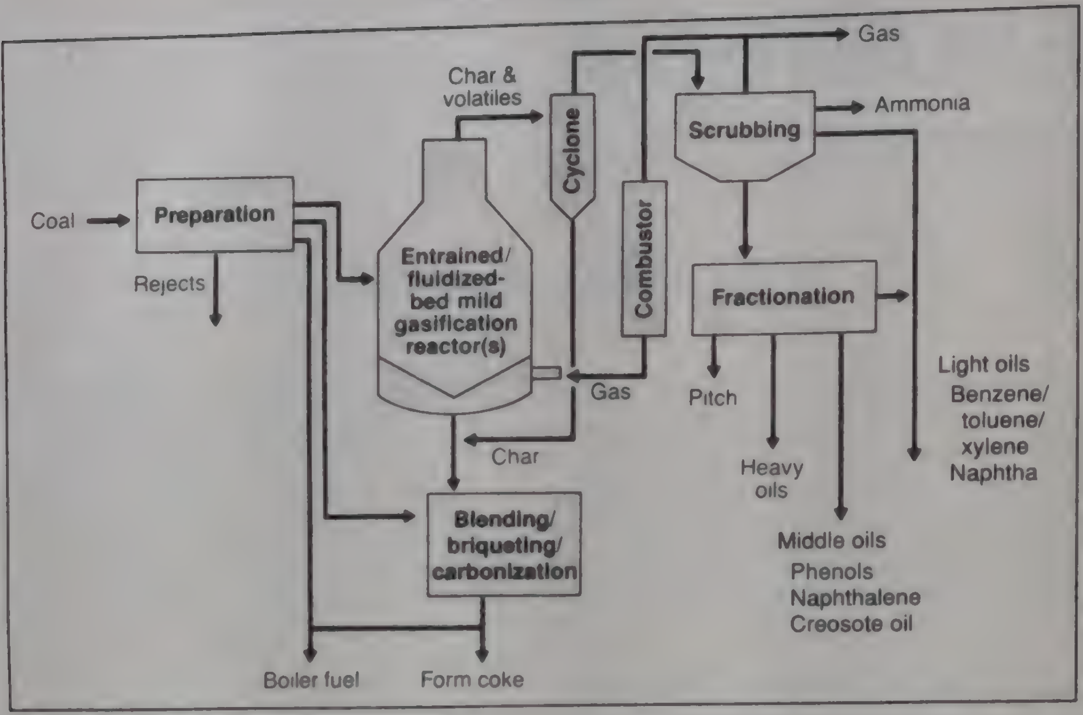
## Coal Gasification -- Interest Revives

The realisation that oil prices are on the way up and the large deficits in the US balance of payments have revived interest in USA in coal gasification to make liquid fuels". The options are direct conversion, indirect conversion and manufacture of substitute natural gas. The direct conversion is the least attractive while indirect conversion via gasification has always been the preferred route with such production of liquid fuels on a large scale for years in South Africa. Gasification under mild conditions is the emphasis in the work at the Institute of Gas Technology, Chicago and other centres. The objective is to make the most profitable mix of products that are appropriate.

Texaco Research Centre's R&D aims at gasification under mild temperatures of about 600°C but pressures are high at about 450 atm. The products are liquid hydrocarbons, char, non condensable gases and an aqueous liquor. There is no total gasification as the residual char indicates and main process of devolatilisation with the hydrogen content going away as hydrocarbons. Main use of the liquids are feedstocks and binders for carbon anodes. Char is usable as with coal.

IGT is jointly developing a fluidised/entrained bed reactor jointly with others. All types of coal are to be processed without pretreatment and without use of oxygen or air. Process heat comes from the recycled hot char and burning of a part of the gases evolved. In effect it is a coking but with more oils, less gas and less char. The outline flowchart is shown in the figure on p. 42.

In another project of United Coal Company Research Corporation, the feedcoal is dried and preheated (with the combustion products) and enters a screwtype reactor where it is volatilised. Residual char is briquetted and further carbonised in a coker to produce metallurgical coke. The liquids from volatiles are processed to diesel fuel grade. There are also other efforts in this direction and also for co-processing of coal with heavy petroleum residues at about 400 to 500°C and under hydrogen -- a sort of H-coal conversion. The economics of mild gasification for a conceptual plant processing 1 million tons of bituminous coal (obviously not what we have in India) may require $105 million with 8,10,000 barrels of liquids per year and net char of 7,22,000 tonnes. The viability depends on a $ 35 per barrel of liquids but if char is processed to metallurgical coke at $ 100 a barrel, the oils could be charged at present prices


Coal
Preparation
Rejects
Char & volatiles
Entrained/ fluidized-bed mild gasification reactor(s)
Cyclone
Combustor
Gas
Char
Gas
Scrubbing
Ammonia
Fractionation
Pitch
Heavy oils
Middle oils
Phenols
Naphthalene
Creosote oil
Light oils
Benzene/ toluene/ xylene
Naphtha
Blending/ briqueting/ carbonization
Boiler fuel
Form coke

While resort to coal for liquid fuels and feedstocks through gasification with or without processing further to synthesis gas are unavoidable in coal rich countries like USA from early 21st century and technologies are on the horizon, India may not be able to take advantage as we could more profitab use our low quality as such for power generation.

*(CE News, 21.5.199*

# Changes in Citric Acid and ADM entry

Two of the top producers of citric acid in the world are moving in different directions -- one to divest and the other to consolidate. In the process ADM (Archer Daniels), the corn-based giant enters the field by a take over instead of by new investments which they had been contemplating for some time. Pfizer is selling out to ADM as per reports for $ 180 million its 60,000 TPA capacity in Southpost N.C. and in Ireland but will retain, 38,000 TPA plant in Groton, Connecticut and sell its production to ADM.

The other giant, Bayer of Germany who came into the picture initially by takeover of Miles Laboratories, is consolidating the position by takeover of J.E. Sturge plant in Selly, UK from the present owners Rhone Poulenc for a reported $100 million -- capacity 23,000 TPA. Bayer's capacity is expected to rise to 1,50,000 or 30% of the world total. It is reported that there is overcapacity and reduced returns perhaps because the market in detergent formulations did not materialise.

ADM is in a happy position of being the largest corn processor for ethyl alcohol and HFCS. The ethyl alcohol goes for gasoline blends with a large element of subsidy from tl Federal and State Governments. They have also launche ADM Biochemicals with investments of $ 125 million make monosodium glutamate, Vitamin C, lysine and ha intention to move into citric acid. The Pfizer acquisition ha come in handy. ADM processes 1.2 million bushels of cor per day as the base and has a cogeneration power/steam pla to meet the energy need -- in the heart of the corn belt Decatur, Illinois. They have started production of lysine wi the largest capacity of 125 million lbs. in the world and inter to go in for penicillin later.

Incidentally, ADM has also become a major new force i carbon dioxide due to the low cost production from its ethy alcohol plants. It is reported that they have a one-third shar of US market (both liquid and solid $CO_2$) with sales of pe haps 2,00,000 tonnes a year. The solid base with maize (corn in USA have helped ADM to move up into chemicals. Th glucose residues are convenient raw materials for citric acid besides molasses. The use of alternative raw materials lik hydrocarbons has not made any progress towards commer cial production of citric acid so far.

For Competitive Imports of Chemicals, Pharmaceutical Raw Materials and Particularly for the Following Items

**Aniline Oil**
**Aerosil**
**Acetic Anhydride**
**3-Cyano Pyridine**
**4-Cyano Pyridine**
**Diethyl Carbonate**
**Dimethyl Carbonate**
**Gum Rosin**
**Hydrogen Peroxide**
**8-Hydroxy Quinoline**
**Crude Iodine**
**Piperazine Anhydrous**
**Pivaloyl Chloride**
**Thiophenol**
**Vanillin**

PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

**CHEMET**

HEAD OFFICE:
Taj Building, 1st Floor, P.B.No. 195, 210, Dr. D.N. Road, Bombay: 400 001
Phones: 2043803/4/5/6/7 Fax. No. 2048654
Cable: DEGUCHEM Bombay Telex: 11-3229/11 4631 DGKM IN

CALCUTTA OFFICE:
Sharma House, 3rd Floor, 1/2 Lord Sinha Road, Calcutta-700 071
Phones: 447306 ■ 446155, Cable: DEGUCHEM Calcutta, Telex: 21-33 25 DGKN IN

MADRAS OFFICE:
10, Kondy Chetty Street, 1st Floor, P.B. No. 1709, Madras 600 001. Cable: DEGUCHEM, Madras
Phones: 582447 ■ 587617 ■ 580796 Telex: 41 7554 DGKM IN

DELHI OFFICE:
214, Hans Bhavan, Wing No. 1, Bahadurshah Zafer Marg, New Delhi - 110 002
Phones: 3311373 ■ 3319787 ■ 3319791 Cable: DEGUCHEM New Delhi,
Telex:31 65921, DGKM IN.

HYDERABAD OFFICE:
905/2, 9th Floor, Babukhan Estate, Basheerbagh, Hyderabad-500 001.
Phone : 242318, Telex: 0425 - 2188, DGKM IN.

### KERALA TITANIUM DIOXIDE UINT

## DCW joins race

The latest entrant in the titanium dioxide race through the acquisition of Kerala Minerals and Metals Limited (KMML) is DCW Limited.

The Rs. 130-crore turnover company has staked a claim for running KMML on the grounds that it is "in the best position to make the titanium dioxide plant of KMML profitable" since it is a manufacturer-exporter of upgraded ilmenite, an important raw material for the manufacture of titanium dioxide.

Dr. Shashi Chand Jain, managing director of DCW, said at a press conference on August 1, that DCW had preliminary talks with the Industrial Development Bank of India (IDBI) but had yet to meet the Kerala government officials.

Dr. Jain pointed out that DCW was the first to approach the Kerala government in 1977 with a proposal to either acquire a stake in KMML or lease it. However, at that time the government was unwilling to consider the move to privatise the company.

Dr. Jain, however, added a rider to his proposal — DCW wants to take over the plant without too many problems and unnecessary liabilities. This is in terms of excess labour and outstanding liabilities with are estimated at over Rs. 80 crore. DCW is also willing to merely manage the unit by leasing it from the Kerala government. Moreover, the company wants to run KMML at the existing capacity of 20,000 tonnes. Dr. Jain believes that the total investment in a project of that size should not be more than Rs. 60 to Rs. 70 crores.

The only concrete proposal to acquire a stake in KMML has been made by the Tata's through TOMCO. The proposal was to first increase capacity utilisation of the unit (which is less than 15 per cent at present) and expand the capacity to 50,000 tonnes per annum. Others in the race are understood to be the Kanorias and the UB Group.

Dr. Shashi Chand Jain agrees that the international norm is for a minimum capacity of 50,000 tonnes. Interestingly, DCW already holds a licence for the manufacture of titanium dioxide, but the company has no intention to go in for a greenfield project unless it manages to persuade Du Pont to part with its technology.

Dr. Jain said that following the Bhopal tragedy, Du Pont is unwilling to risk an entry into India. At present, DCW has developed a substitute for titanium dioxide which is being sold to the paint industry under the brand name titox. This acts as an import substitute to a certain extent. DCW has also been exporting upgraded ilmenite.

DCW has further claimed that since it is the only manufacturer of raw material for titanium dioxide any new entrant will have to first set up capacity to purify ilmenite ore. India has the richest deposits of this ore in the world. DCW has announced plans to modernise its caustic soda plant by replacing power intensive mercury cells with membrane cells aiding energy consumption. Its soda ash division is also being modernised and expanded.

DCW Limited has announced a bonus issue in the ratio of 3:5 and a final dividend of 13 per cent on equity. This takes the total dividend to 25 per cent for the year. The company has also assured a minimum dividend of 15 per cent or expanded capital for the current year.

Following the bonus issue the capital of DCW will be expanded to Rs. 9.42 crore. This is, however, subject to ratification by shareholders at the annual general meeting on September 25, 1990.

Sales for the year were Rs. 133.
crore as compared to Rs. 170.33 cro
in the previous 18-month period — th
amounts to an 18 per cent increase
annualised basis. Gross profit amount
to Rs. 11.2 crores. The managing dire
tor also announced that during the fi
quarter of the current year the compa
had achieved a turnover of Rs. 25 cro
with a gross profit before depreciati
at Rs. four crore.

---

### SAFETY CODE SOON FOR CHLOR-ALKALI PLANTS

A safety code for chlor-alkali plant
categorised as 'major accident hazar
plants' due to the potential danger the
pose to life and property, will
evolved in the near future by the Reg
onal Labour Institute (RLI), Madras

The code of practice is the result
three years of detailed study of th
safety methods adopted in 10 majo
chlor-alkali plants in the country —
eight in the southern region, one in th
west and one in the east — the RLI'
acting director, Mr. A. Alagar said
Having 10 tonnes of chlorine — a heav
gas which will not disperse easily in th
atmosphere in case of a leak — at a tim
in a factory site poses a major acciden
hazard. The plants studied had at leas
200 tonnes of chlorine on hand at an
given time. There are over 130 units i
India which cross the 10-tonne threshol
and the imperative need for safety gui
delines prompted RLI, which come
under the Union Labour Ministry, to
take up the study, he said.

Mr. Alagar said a team of expert
studied the siting of the plants, the safety
organisation, storage facilities, mainte-
nance, different systems like chlorine
system, brine system and pollution. Var-
ious recommendations formulated on
the basis of the study would be sent to
each palnt, all private except one in the
joint sector, after approval by the RLI
headquarters.

Priya

# TEPIC - G

THE REVOLUTIONARY CONCEPT IN
POWDER COATING MANUFACTURE

**Tris(2,3-Epoxy Propyl) Isocyanurate**

Alternate name: **Triglycidyl Isocyanurate (TGIC)**

TEPIC-G is one of the basic raw materials for powder coatings, a field having tremendous growth potential.

A combination of TEPIC - Polyester resin gives the best mechanical properties to the powders including excellent thermal, electrical and weather resistances.

For further details, please contact:

**PRIYA CHEMICALS**

HEAD OFFICE:
Podar Chambers, 4th Floor, S.A. Brelvi Street, Bombay 400 001
Phones: 2860596 ■ 2863611 ■ 2863676 ■ 2863783 ■ 2863900
Telex: 0118-5495 PRIA IN ■ 0118-6556 PRIA IN ■ 0118-2472 PODR IN

BRANCHES

— HYDERABAD OFFICE —
Prashanthi Commercial Complex, 6-9-30/6 to 8/B, 2nd Floor, Basheerbagh,
Hyderabad - 500 029 Phone: 236068

— DELHI OFFICE —
Flat No. 8, 10th Floor, Akash Deep Bldg., Barakhamba Road, New Delhi - 110 001
Phones: 3314512 ■ 3310413

— BANGALORE OFFICE —
Devatha Plaza, 131/132, Residency Road, Bangalore - 560 025 Phone: 214027

— MADRAS OFFICE —
5-J Century Plaza, 560-562 Mount Road, Teynampet, Madras 600 018.
Phone: 451597 ■ 451031 Telex: 041-8809 PRIYA IN

— CALCUTTA OFFICE —
"LORDS", 3rd Floor, 7/1, Lord Sinha Road, Calcutta 700 071
Phone: 222378 ■ 222379 ■ 228015 ■ 226367 ■ 300765

# Warehousing committee to resume work

Work on Antop Hill Warehousing Company Ltd. is to resume, now that courts have removed all legal obstacles which had blocked construction of the controversial chemical storage project in the city since October 1986.

The Supreme Court has discharged the company from all writ petitions. This followed filing of an affidavit by government of Maharashtra in which it accepted the Garg Committee report and directed the company to construct the godown strictly in accordance with the recommendations of the committee.

The Bombay High Court has also discharged the company from a writ petition filed by Save Bombay Committee in its ruling on March 30. As for the recommendations of the Garg panel, godowns will be built for the construction of non-hazardous chemicals only.

The company had spent almost Rs. 4.30 crores on the project when work stopped in 1986. Some traders who had booked godowns for hazardous chemicals have since converted their applications for storing non-hazardous chemicals, and others have cancelled their applications.

The turn of events is unhappy for traders as well as those who opposed the project on environmental grounds. This is because basic problem of storage on hazardous chemicals remains unresolved and will continue to be located at the present locations in the city.

Instead of providing a practical solution and perhaps giving in to objections raised against the project, the Garg committee with one stroke of pen has changed the entire complexion of the project, in the words of Mr. S.K. Joshi, former president of the Chemical and Alkali Merchants Association, whose members have contributed Rs. 1.30 crores towards the project. Instead of suggesting remedies or corrections the committee has torpedoed the whole concept and the scheme. Some officers in the fire brigade and municipal corporation have also doubted the wisdom of the recommendations, according to Mr. Joshi.

It appears that under the present conditions the chemical traders will carry on their business in Vadgadi. Roads are in bad shape and the heavy traffic has made things worse during the rains. Sanitation and upkeep are virtually non-existent and safety and security are at a premium.

---

## ALUMINIUM USE, OUTPUT ON THE RISE

With growing consumption and production of aluminium in the country, extrusion foils and sheets have emerged as the major area of competition in the industry, according to Mr. V. Sagar Sachdev, Managing Director, Indian Aluminium, Company (INDAL). At a press conference recently, Mr. Sachdev said consumption and production of the metal would further grow in the next three to four years and there is an expectation that prices would stabilise at S1750 and S1850 the minimum viable rate.

He said the aluminium industry is on an upswing, aroung the world, with prices in the past few years touching S2000 to S3000 a tonne. The world aluminium consumption in the free market is pegged at 19.8 million tonnes. As part of its export strategy, INDAL had now fleshed out a plan to step up exports of semifabricated aluminium products. Since demand was more geared towards non-traditional items, it is believed that semi-fabricated goods would fetch a wider market.

Commenting on the Indian aluminium scene, Mr. Sachdev said while the total installed capacity in the industry is about 6.20 lakh tonnes, none of the plants are producing at full capacity. The unutilised capacity is to the tune of
55,000 tonnes primarily as a result
power shortages. Although with
commissioning of National Aluminiu
Company (NALCO), India is on
verge of self-sufficiency in aluminiu
power shortages posed a major proble
for the company, he said. Due to
power tariff, INDAL production
higher by Rs. 3,000 than its chief co
petitors.

According to Mr. Sachdev, alumi
ium could also be produced in lar
quantities by recycling aluminiu
waste. Against an annual offtake
about 19.8 million tonnes, the contr
bution of recycled aluminium could
as high as 6 million tonnes. Towar
this end, INDAL is considering settin
up a plant to produce aluminiu
through recycled waste.

Pointing out that the demand for alu
minium is coming from various sou
ces, according to the INDAL Managin
Director, the automobile industry
alone giving a boost to the industry, a
leading automobile companies are plan
ning to depend more on the metal fo
producing cars. Against the present con
sumption of seven kg for producing
car, the end of the current decade woul
see a rise in consumption by automo
biles to about 200 kgs per car he added

INDAL is planning to set up captiv
power plants to cope with the powe
shortages. Two plants, one at the smelte
in Hirakud (Orissa) and another at Bel
gaum in Karnataka would be installe
within the next three years.

Dwelling on various plans, the company has on the anvil, Mr. Sachdev sai
that after the modernisation of its plan
at Belur, the rolling capacity would go
up from the present 25,000 tonnes to
over 50,000 tonnes per annum. An investment of Rs. 15 crores is also in the
offing to spruce up its plant at Taloja in
Maharashtra. Another Rs. 20 crores is
going to be spent on the installation of
a seven-colour printing machine for the
company's foil plant ar Kalwa (M.S.)

### YES, INTERMEDIATE UNITS

## GITCO evolves export promotion programme

The Gujarat Industrial and Technical Consultancy Organisation (GITCO), has evolved a unique export promotion programme for small and medium scale units manufacturing dyes and intermediates with the ultimate objective of building them into strong and predominantly export oriented units.

The programme which has received the support of Industrial Development Bank of India (IDBI), envisages export of dyes and chemicals by hitherto non-exporters. The aim is to select a group of 8 to 10 small and medium scale units and make them capable of exporting Rs. 1 crore worth of dyes every year. "This is the commitment we have made to the IDBI, on the basis of of which GITCO has received the okay", Mr. Chinubhai Shah, managing director of GITCO said.

Mr. Shah believed that Gujarat, with its strong presence in chemicals could emerge as a large exporter of dyes and chemicals and this could be achieved through small and medium scale units, provided a viable and effective export promotion programme was evolved. "Our programme aims just that," Mr. Shah said adding that the international trade in dyes and chemicals is on the threshold of an explosive growth and there was no reason why India should miss the bus.

The programme envisages contact between the selected units and the leading export houses which would assist them to export. The response to the communication sent by GITCO was very encouraging and already received inquiries from 10 units about participating in the programme, Mr. Shah said.

A panel of technical consultants would provide their expert services to the selected units GITCO would bear the cost of counselling services rendered by the consultants but in cases of detailed work, the unit would bear the cost.

It was proposed to offer a "total service package" continuously for a period of 12 months to selected units for developing their export business through the marketing assistance cell and chemical division of GITCO.

The selected units would comprise those who manufacture basic drugs, acid dyes, direct dyes, organic pigments, reactive dyes and metanilic acid. An action plan for each unit would be drawn up after a management audit. The action plan would focus attention on improving product quality, yield and packaging apart from providing market information. GITCO would represent to the government, local authorities and agencies for procedural and documentation formalities and claim export benefits on behalf of selected units. Buyer-seller meets are proposed to be organised so that the units could establish direct business contacts with merchant exporters. If unit members desire to participate in an international trade fair, GITCO would arrange for their participation under the guidance of Chemicals and Allied Export Promotion Council, Mr. Shah added.

---

### VITAMIN C FORMULATIONS PRICES RAISED

Prices of Vitamin C formulation have been raised with effect from Jul 30. The hike will cover vitamin tablets injections and drops. Vitamin A and C are under price control having a MAPI (maximum allowable post manufacturing expenses) of 75 per cen Major manufacturers of vitamin C ar the Sarabhais, Alembic, Jayant Vita mins, IDPL and Cyanamid.

Manufacturers of

SULPHANILIC ACID

FOR EXPORT OF YOUR PRODUCT

Please Contact:

Mr. DHAIRESH K. SANGHVI

M/s. KANTILAL SANGHVI & CO.

3rd Floor, Union Co-operative Insurance Bldg.,
23, Sir Pherozeshah Mehta Road,
BOMBAY 400 001
Phones: (Office): 2870836/2873217/2873628
(Resi.): 4226850/4229086
Telex: 1185725 EXIM IM Gram: EXPIM, Bombay
Fax: (22) 2874153

### FIXING FAIR SELLING PRICE FOR PARAXYLENE

## BICP exercise ruled out

The industry ministry has once again turned down the request by the petroleum and chemicals ministry to ask the Bureau of Industrial Costs and Prices (BICP) to fix a single fair selling price for paraxylene produced in the country.

The Directorate General of Technical Development (DGTD), under the industry ministry, has also refused to undertake on its own a study of the paraxylene and PTA capacities of Reliance. The petroleum and chemicals minister, Mr. M.S. Gurupadaswamy, had written to the industry minister, Mr. Ajit Singh, requesting for working out a single fair selling price for paraxylene.

The industry ministry replied that the BICP would not be able to take up the work and instead suggested that an inter-ministerial committee, which could include a representative of BICP be formed to do the job. The petroleum and chemicals minister, however, wrote back pointing out that an inter-ministerial committee could not be a substitute for a job that should be done by the BICP.

When the BICP was asked to work out the fair selling price of paraxylene, a few months ago, it merely updated its report on aromatics, submitted to the government in December 1988. The BICP did not take into account the cost of production of paraxylene for Reliance on the grounds that at the time of the 1988 report, Reliance had not submitted any data to BICP.

Subsequently, a study of Reliance's cost of production of paraxylene was made by the cost accounts branch (CAB) of the finance ministry. It was argued that if BICP was to give its opinion on the CAB report, it would amount to BICP's cost accountants questioning the findings of another body of cost accountants. The fair selling price of paraxylene worked out by CAB for Reliance is around Rs. 18,500 per tonne. This is based on the data supplied by Reliance.

The fair selling price of paraxylene worked out for the Indian Petrochemicals Corporation Limited (IPCL) by BICP in its updated report, on the basis of certain assumptions, works out to around Rs. 13,000 per tonne to Rs. 14,000 per tonne. IPCL is now claiming that its cost of production of paraxylene has gone up because of a higher price for C-5 reformate, which goes into the production of paraxylene, being charged by the Indian Oil Corporation (IOC).

A fair selling price for paraxylene is considered necessary since there are three producers and four consumers of this raw material, required for the production of PTA and DMT, each buying or selling at different costs. While refusing to undertake the task of assessing the capacity of the paraxylene and PTA plants of Reliance, the DGTD has suggested that another committee be formed to go into it since there could be administrative implication.

This has surprised observers since the DGTD is a technical body of the government and is fully competent to do the job. The petroleum and chemicals ministry has not accepted the position taken by the DGTD. The impression is now gaining ground that the industry ministry is fighting shy of studying controversial issues in the petrochemicals sector. Both the tasks, sought to be entrusted to the two bodies under the industry ministry, involved Reliance.

A fresh study of the paraxylene and PTA capacities of Reliance was sought to be made since Reliance claims that it has surplus paraxylene that it can supply to domestic users. Bombay Dyeing, which has facilities for captive production of paraxylene for its DMT plant and is dependent on outside so ces, has been refusing to buy paraxyl from Reliance saying that it doub about the capacity of Reliance to sup paraxylene.

The petroleum and chemicals min ter, Mr. M.S. Gurupadaswamy, had al said that taking into account the licens capacity of the paraxylene plant, t government had reservations about t company's ability to supply large qua tities continuously to other consume Reliance had set up facilities for pr duction of paraxylene for captive us subsequently, it was given permissi to sell paraxylene when not consume for operational reasons, in the PT plant. The licensed capacity of Relia ce's PTA plant is 100,000 tonnes co responding to a paraxylene capacity 67,000 tonnes, which has been endorse on its licence. However, the actu capacity of Reliance's paraxylene pla is reported to be higher, though no exa estimates of its capacity are available

Reliance has also been allowed t double the capacity of its PTA plan from 100,000 tonnes per annum t 200,000 tonnes per annum. It was in thi context that a fresh study of the capacities of the paraxylene and PTA plant of Reliance was sought by the petroleum and chemicals ministry.

---

### SHARDA DRUGS

Sharda Drugs, a small-scale unit set up at village Rajipur in North Gujarat to manufacture basic drugs will be soon converted from a private limited into public limited company.

The factory has two manufacturing units viz antibiotics plant and general drugs plant. The company will enter the capital market by Diwali to raise Rs. 3 to Rs. 4 crores to meet the expansion and modernisation plans. Talking to newsmen Mr. R.B. Patadia, Managing Director of the company said that the factory will generate employment for 50 people.

FOR YOUR IMPORTS AT COMPETITIVE CIF PRICES

Hydroxylamine Sulphate
Thiourea
Propylene Glycol USP/Tech (Ex-Arco)
Lactose (Ex-NCZ)
Dimethyl Sulphoxide
Dimethyl Carbonate
Guaiacol
Perchloro Ethylene
Trichloro Ethylene
Dimethyl Formamide
Gallic Acid
Dibutyl Tin Oxide
Beta Naphthol
Petroleum Ether 40/60 & 60/80
Bis Trimethyl Urea
Methylene Dibromide
2,6 Diethyl Aniline
2,4 Ditertiary Butyl Phenol
Trimethyl Phosphite
Triethyl Phosphite
Thiophenol
Thiophene
Methane Sulphonyl Chloride
Methane Sulphonic Acid 70%
Piperazine Anhydrous
Thionyl Chloride
Sodium Nitrite
Cellulose Powder
Ortho Chloro Toluene
Ortho Chloro Benzoic Acid
Ortho Chloro Benzaldehyde
Sodium Bichromate
Hydrogen Peroxide 50%
Phenothiazine
1-Bromo 3-Chloro Propane
Propiophenone
Nitromethane
Iodine Crude 99%
2,4 Dichloro Toluene
Methyl Chloro Formate

Please Contact for further details:

**S. AMIT & CO.**

A TRUSTED NAME FOR IMPORT OF YOUR CHEMICALS
105, Neelam Centre, "A" Wing, Hind Cycle Road,
Worli, Bombay 400 025.
Phones: 4934627-28/4933310
Cable: "DULICTOL"
Telex: 011-76877 CMIT IN
011-74486 AMIT IN
Fax No.: 22-494950-4
Madras Office: Queens Court, 134, Montieth Road, Madras 600 008.
Phones: 860172/866942
Hyderabad Office: 8-3-215/7 (First Floor), Srinivasa Nagar Colony (West),
HYDERABAD-500 890.
Phone: 35110

Our Associates: M/s. CHEM AMIT

# RCF abandons Gulf plan

Just a year ago, several Indian companies were planning to set up mega projects in the Gulf, based on the cheap energy available there. At least one of them has dropped its plans says a report appearing in the Times of India.

Rashtriya Chemicals and Fertilisers planned to set up a Rs. 1,000 crore ammonia plant at Sharjah in collaboration with the Sharjah government and some non-resident Indians. RCF was to hold a 51 per cent stake in the project.

But the Sharjah government had failed to confirm its financial participation and guarantee uninterrupted supply of natural gas. Thus the project has been called off.

The project was conceived in February, last year when and Indian team visited the International Trade Spring Fair held in Dubai, and established contact with Gulf Commercial Corporation, owned by Mr. Abdul Rahman Al-Quasim.

As per the initial deal, GCC agreed to supply 4 million cubic metres of gas per day which would yield about 2,700 tonnes of ammonia daily.

The rationale behind the RCF project, as with the other planned Gulf-based projects like Reliance Industries' refinery and Gujarat Narmada Valley Fertilisers' phosphoric acid plant was that India could have access to its own source of materials like fertilisers and oil which it imports in bulk at enormous foreign exchange outflow.

Under the deal, the agriculture ministry would have entered into a buyback contract with the producing company to import ammonia and urea.

India imports about 90,000 tonnes of ammonia today from Kuwait, Qatar, Saudi Arabia, Bahrain and the USSR.

Apart from ensuring a steady and assured supply source, the project would have created opportunities for its employees, helped RCF peddle its engineering skills, and yielded dividends.

The project fell through because the Sharjah government failed to back the promises made by the GCC. During the preliminary talks GCC and RCF planned to produce 2700 tonnes of ammonia.

The ministry asked RCF to get a letter from the Sharjah government guaranteeing gas supply. Since GCC was unable to produce a letter from the Sharjah government, the proeject has been shelved.

In January 1989, RCF had put out advertisements in Dubai-based newspapers offering knowhow for fertilisers, petrochemicals and electronics, agrarian research, marketing services and management consultancy.

Later, during the trade fair in February the preliminary project details were worked out and GCC and Indian trade fair authorities splashed the news in Gulf newspapers and the international press.

Following the news, Reliance Industries declared its plans to set up a $900 million refinery of six million tonne capacity in Jordan.

At the same time a $1.3 billion phosphates fertiliser plant was also proposed to be set up in Jordan. Gujarat Narmada Valley Fertilizers too planned to set up a phosphoric acid plant to be located in Jebel Ali, a free trade zone.

While not much has been heard about any of these projects, Indian Petrochemical Corporation Limited has just announced that it plans to construct a Rs. 300-500 crore petrochemicals project in the Gulf. Southern Petrochemical Industries announced recently, that it intends to set up a chemicals plant Jordan.

## CALL FOR NEW PEST CONTRC TECHNIQUES

BHC 10, the pesticide suitable for d land crops is likely to be banned by t Government due to the global policy environment protection.

The Director of Agriculture, M Malathi, while disclosing this urged t scientists to find out a viable alternativ

Speaking at the State level conf rence of crop protection workers joint conducted by the Tamil Nadu Agricu ture University and the State Depar ment of Agriculture at Coimbatore c Aug 7, she pointed out that there wa a gap between demand and supply i respect of bio-products for the contr of crop pests like certain defined viru which is not produced on a commercia scale.

Consequently, farmers are not able t adopt such biological methods to con trol pests of crops like cotton. She als pointed out that several small bic control centres be opened to produc bio-products on a commercial scale. D Vidyasagar, Director of the Centre fo Plant Protection, said Tamil Nadu is th first State to set up pests surveillanc centres.

The data collected from the village about the outbreak of pests and disea ses will be computerised soon and wil be made available for effective forecast

Over Rs. 6,000 crores worth of farm products are being destroyed by pest and diseases. It is necessary to reduce this wastage by motivating farmers tc adopt various techniques like the integrated pest management, he said. Mr Arumugham, Director of Seeds, made a plea for the import pheremones as the domestic product is not effective in controlling the Amercian boll worm on cotton.

# New technology for alcohol production

A technology for producing alcohol rom waste rice straw developed at the ndian Institute of Technology in Delhi night transform India into an ethanol-surplus country and help tide over the current petrol crisis, according to Dr. T.K. Ghose, developer of the technology.

A 500-litre pilot plant for alcohol production from rice straw is waiting to be commissioned at IIT Delhi, Dr. Ghose said. But shortage of funds has held up its commissining.

Ethanol is a starting point for hundreds of chemicals manufactured by the chemical industry. In recent years it has also been regarded as a potential alternative fuel to run petrol and diesel engines.

India produced some 800 million litres of ethanol last year, but, according to officials in the department of chemicals, there is no surplus alcohol.

Engineers at the IIT-Biochemical Engineering Research Centre say if the new technology is validated through the large scale experiments planned in the pilot plant, industrial production of alcohol from rice straw could be initiated.

A committee set up by the government last year had ruled out the immediate use of alcohol in the transport sector because of non-availability of surplus alcohol.

The committee, in its report submitted to the petroleum ministry in mid-1989, said at the current prices of ethanol and diesel, it would be uneconomical to introduce it as a fuel. But until now molasses have been the only source of alcohol in India. Alcohol production from waste rice straw could make it economical, Dr. Ghose said. Researchers at the IIT Department of Mechanical Engineering who established indigenous technology for using alcohol blends as fuels say ethanol could also substitute diesel used to run water-pumping sets in farms.

## RANBAXY LABORATORIES

Ranbaxy Laboratories Ltd. has shown improved results for the year ended March, 1990. Sales during the year touched Rs. 199.11 crores, a 39 per cent increase over the preceding year's figure. The company has declared a final dividend of 13%, taking the total paid during the year to 25%. This final dividend is paid on the enhanced capital of Rs. 9.11 crores. Profit before depreciation amounts to Rs. 13.35 crores (Rs. 10.19 crores during the preceding period). Pre-tax profit is Rs. 8.83 crores with post-tax profit being Rs. 8.09 crores (Rs. 5.57 crores). The amount charged to depreciation is Rs. 4.52 crores (Rs. 4.06 crores.).

CIF OFFER FOR YOUR ACTUAL IMPORTS

1:3 Dichloro Acetone
Meta Hydroxy Benzaldehyde
2-Amino Thiophenol
Propiophenone
2-Chloropyridine
C-Acid
2B-Acid
4B-Acid
Acrylic Acid
Butyl Acrylate

TI & M LIMITED

TIM

GPO BOX 1308, BOMBAY -1 PH: 2870903/4, 2870492 TELEX: 11-6378.2216
PO BOX 9151, CALCUTTA-16 PH: 442595-9 TELEX: 21-7359/5187
PO BOX 1960, MADRAS-1 PH: 514261 TELEX: 41-8301
DELHI-17, Community Centre PH: 667177/662004

DELAY PUSHES UP KAKINADA PROJECT COST

# Nagarjuna Fertilisers seeks new terms of financing

A huge cost overrun of Rs. 150 crores has forced Nagarjuna Fertilisers and Chemicals to seek new terms of financing for the long-delayed project at Kakinada in Andhra Pradesh. It has also prompted the Industrial Development Bank of India (IDBI) to impose tighter controls. Led by the IDBI, the institutions are now insisting that the promoters step up their equity contribution, appoint a finance director of IDBI's choice (the company has just appointed a finance director), and expand the board from the present 15 to 18 board members to provide greater representation to funding institutions.

Nagarjuna's project to manufacture five lakh tonnes of urea and three lakh tonnes of ammonia per annum, makes it the only greenfield fertiliser project in the country now (Mr. Aditya Birla's Indo-Gulf venture has recently got going). Its original project cost was estimated at Rs. 550 crores in 1984, before the Andhra Pradesh Government handed it to the Nagarjuna group. This was then updated in 1986 to Rs. 635 crores when the Nagarjuna group submitted its project proposal. The cost has now been revised to Rs. 785 crores —a 27 per cent increase from the 1986 figure.

Even this cost overrun has been arrived at after the company deferred expenditure of about Rs. 28 crores on a housing colony, stand-by facilities and so on. According to the new financing package which the IDBI approved in July, the total loan component has been pegged at Rs. 589 crores inclusive of the foreign currency component of Rs. 193 crores. Equity is to be raised to Rs. 196 crores from Rs. 127 crores. This alters the debt-equity ratio from the earlier 4:1 to 3:1.

As a result, the project's promoters — chiefly, the state government, non-resident Indians, farmers, the public sector Krishak Bharati Co-operative (Kribhco) and the Nagarjuna group, will have to bring in a collective Rs. 23 crores, in addition to the Rs. 65 crores fixed earlier. The Nagarjuna group itself will chip in an extra Rs. 4 crores or so, taking its contribution to almost Rs. 10 crores. Kribhco has agreed to double its share of the equity from Rs. 10 crores to Rs. 20 crores. Correspondingly, the public issue has been increased from Rs. 62 crores to Rs. 108 crores.

The new financing terms could pose a risk for the Nagarjuna group in terms of losing control of the venture to the government and Kribhco. Apart from the institutions demanding three additional seats on the board, Kribhco apparently wants one more seat on the board (it already has one) as the price for doubling its current stake to Rs. 20 crores.

But the Nagarjuna group has written agreements with its copromoters on voting together as well. Co-promoters cannot disinvest for three years, after which the group will have first option to buy their stakes. For its part the company envisages no problems in getting the issue fully subscribed when it enters the capital market late this year. Managing director K.V.K. Raju says: "Andhra Pradesh is a rich untapped market and if we go about our public issue properly it's bound to be fully subscribed, if not oversubscribed."

Nagarjuna Fertilisers aims at roping in farmers in a big way as Mr. Raju says, "our objective is to make every farmer in the state a shareholder. This is the mission with which we will be launching our capital issue".

The much-postponed public issue is not, however, the company's most pressing problem. Its immediate concern is to find a successor for Mr. Mant
Sondhi, who resigned as chairman in
wake of the cost escalation problem.
Sondhi reacting like the financial in
tutions, had reportedly taken str
exception to being kept in the d
about the huge cost overrun and h
resigned in protest in March last.

At that time Mr. Raju had said t
this was no setback for the compa
which was hopeful of getting Mr. N
isimhan, a former governor of t
Reserve Bank of India and the Asi
Development Bank to fill the positio
Mr. Narasimhan who was also finan
secretary to the Government of Ind
had been asked to head Nagarjuna Fe
tilisers as early as 1986 but had defe
red taking up the position on account
the ADB assignment.

Mr. Narasimhan, however, appea
reluctant to take up the job although
recent weeks he has undertaken othe
responsibilities like the chairmanship
the venture capital fund launched by th
A.P. Industrial Development Corpora
tion.

Reacting to the allegation that finan
cial institutions had been kept in th
dark about the staggering cost overrun
Mr. Raju said this had come to ligh
during a mid-term review undertaken i
December when most of the contract
had been finalised and equipment cost
firmed up. This was the normal practic
and there was no question of having
kept the facts from the institutions, h
said.

On the escalation, he said, it has occurred over a 17-month period owing to delays in getting the necessary governmental and institutional clearance. He explained that most of the increase (Rs. 84 crores) was on account of the exchange rate variation between 1986-89, with the higher cost of site development and piled up work because of adverse conditions accounting for another Rs. 21 crores. The cost of additional equipment prescribed by the Pol-n Control Board had taken up Rs. 6 es and the higher interest burden on ign currency loans availed of under AS another Rs. 6 crores. The gen- cost escalation as such was Rs. 33 es, he added.

agarjuna Fertilisers was able to con- the overrun to Rs. 150 crores by erring the housing colony (Rs. 28 res) and other back-up facilities ch is no way adversely affected by project.

Ar. Raju said, "our concern has been put up a sound project. Because of or soil conditions 12,000 piles had to driven against the 4,000 envisaged ginally. In many places 35-metre pth piles had to be used instead of 23 tres because the original consultant d failed to take into account the clonic and tidal wave conditions pre- ent in Kakinada. Due to this the May clone had absolutely no impact on the nt".

Dismissing the price escalation as not ry significant for a project of this size, e managing director said that Nagar- na Fertilisers had been able to contain sts because of effective steps taken by This included shortening the con- uction time to 33 months against the rmal 36 to 42 months, and by resort- g to competitive international bidding.

So far, an expenditure of Rs. 450 ores has been incurred on the project ith commitments up to the end of July talling Rs. 625 crores. They are sche- uled to complete mechanical work by ugust 1991 and to begin commercial roduction by November.

In fact, Nagarjuna Fertilisers is in the idst of finalising gas supplies with the as Authority of India Ltd. (GAIL). xecutive vice-president in charge of he project R. Krishnan said that an greement is to be signed in the next ortnight.

The Nagarjuna plant will require 1.3 million normal cubic metres a day and company officials said a major advantage is the price edge it will enjoy vis-a-vis other fertiliser projects coming up in the country. In view of the proximity of the Krishna-Godavari basin, gas will be around Rs. 850 cheaper than that supplied by the HBJ pipeline.

This, as Mr. Raju pointed out, is not the only advantage that Nagarjuna Fertilisers has. "We have not only feedstock at our doorstep but also the market. Our greatest strength is the network of 2,400 dealers in the state who have made a signal success of our market seeding programme. When our project comes on stream we can bank on the brand loyalty the company has built up."

## SHREE KRISHNA PETRO

Shree Krishna Petro Yarns Ltd. has achieved a turnover of Rs. 25.80 crores, against Rs. 12.51 crores in the corresponding period last year. The net profi after interest, depreciation and taxes stood at Rs. 50.47 lakhs (Rs. 12.74). The company has earned an EPS o Rs. 5.50.

The company is diversifying int spinning, for which it has already received registration for installation of 25,000 spindles to manufacture spun synthetic blended yarn.

The company has tied up its working capital and term loans with State Bank of India to part-finance the project and the balance would be met by the public and a rights issue.

The company in the current year achieved a turnover of Rs. 7.55 crores for the first quarter ending June 30, 1990. The directors expect to achieve a turnover of Rs. 40 crores. The board of directors met on August 10, to recommend a final dividend.

FOR MOST COMPETITIVE CIF OFFERS FOR:

**Rangolite**
**Hydroquinone Photographic Grade**
**Hydrosulphite of Soda**
**and other Chemicals**

Please Contact:

**M/s. K. SANGHVI & CO.**

308, 'Gulab' 3rd Floor,
237, P.D 'Mello Road,
Bombay 400 001.

Phone: Office: 2612232/2610711 Resi: 8128473/8226451
Telegram: KEYSANGHVI Telex: 11-73516 KSC IN
Fax No.: (22) 2618970

# 'Drug industry pressurising Govt'.

The recent hue and cry made by the pharmaceutical industry and trade against the proposed changes in the drug policy in general and drug prices in particular are considered baseless and meant to pressurise the government at a time when the Parliament session is to commence.

The industry has started an advertisement campaign in national newspapers against the proposed changes highlighting the issues on which it feels 'victimised' and trade and industry have threatened to go on strike all over the country. It appears that the government has buckled under this pressure.

According to a spokesman for the Association for Consumers Action on Safety and Health (ACASH) all the arguments put forward by trade and industry are far from the truth. The recent decision of the government to recover dues under the Drug Price Equalisation Account (DPEA) from various companies has raised a storm. The supreme court has upheld the government decision and directed the companies to pay back the 'unintended profits'. The industry is reluctant to pay this sum amounting to Rs. 400 crores. The industry is trying to justify the rampant overpricing and the government decision is negated.

ACASH points out that many of the statements in the open letter to the Prime Minister are totally untenable. Analysis of factual data compiled by the association of 30 top pharmaceutical companies for the past eight years and more reveal that all the companies have made good profits, distributed higher dividends and in some cases, issued bonus shares despite their complaint that the increase in prices of finished products is not commensurate with the rise in raw material prices. The association feels that the government decision to club the category I and II products together with a mark up of 85 per cent was a step in the right direction.

The association has also refuted the contention of the drug industry that drug prices in India are the lowest. The study conducted by the association shows that in several cases the drug prices (as on January 1987) are higher in India compared to some of the world procurement agencies, whereas the raw material prices are very low compared to the retail pack prices.

Also, the drug prices should be taken in relation to the totality of socio-economic situation in the country. Comparing them to world prices in isolation is only a publicity gimmick. Moreover, the quantities of drug consumption should not be equated with consumption of food items like coffee, tea and rice.

An ACASH spokesman has said the industry has always tried to brush off demands from consumers regarding the abolition of irrational drugs. Hazardous drugs which are removed from the market in developed countries are openly marketed in India with totally incorrect indications. The association hs given an instance of Lopermide, a drug used to treat diarrhoea, which has been withdrawn worldwide by Janssen (Johnson & Johnson), but is being openly marketed in India. The association has aruged that the industry's demand for liberalisation does not augur well for the consumer. It has opined that there should be no liberalisation without rationalisation of drugs. All these facts reveal the hollowness of the industry's claim. It has appealed the government to go ahead with the proposed changes in the DPCO.

---

## TOTAL DECONTROL OF DRUGS RULED OUT

The Petroleum and Chemicals Minister, Mr. M.S. Gurupadaswamy, ruled out the possibility of total decontrol of drugs in the country.

In an interview, Mr. Gurupadaswamy said, he was for selective control o drugs to make available certain vital an basic drugs to the people at a reasonable cost. The Government's stand o drug control could be viewed from th fact that it had removed 40 drugs from price control in 1989-90. There was no question of bringing more and more drugs under price control.

The Minister, however, made it clear that the Government had a right to fix price of different drugs and it could not go back from this practice. Mr. Gurupadaswamy stressed the need for a reasonable price for basic drugs and wanted drug manufacturers not to exploit the people.

The industry owed the Government a huge sum by way of taxes and instead of paying the dues, the industry was resorting to "intimidatory tactics", he said. He wanted the industry to pay the dues, amounting to over Rs. 150 crores till 1983, and the dues for the remaining period, the money from which would be used to revive sick industries and develop and modernise other drug industries.

---

## SURVEY IDENTIFIES THRUST EXPORTS

Exports of chemicals, garments, cotton textiles and diamonds are increasing whereas iron ore, natural silk and frozen shrimps exports have been declining.

This is indicated in a survey on thrust areas in Indian exports carried out by professors of the Indian Institute of Foreign Trade. The product groups were identified according to past statistical performance of individual product categories in the 1980s. Thirty one product categories, which account for about 76% of India's exports, were considered. Product groups that exhibited rates of growth higher than the aggregate average of 12.24 per cent and account for more than five per cent of India's exports in 1988-89 were considered

SC Star Chemicals

FOR YOUR IMPORT REQUIREMENTS OF

**Glycine (Aminoacetic Acid) USP**
**Glycine - Pyrogen Free**
**Glycine BP**
**Glycine Tech Grade**
**Glycine Food Grade**

**And for other Chemicals, Pharmaceuticals & Intermediates**

PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

MADRAS OFFICE:
D-4, 2/36 RAMS SQUARE
2, Village Road
MADRAS 600 034
Tel: 864430/8250097
Tlx: 041 25164 STAR IN
FAX: 044 473762

HYDERABAD OFFICE:
'NALANDA' Unit No. 7
6-3-649, Somajiguda
Hyderabad 500 482
Tel: 210288
TLX: 0425-6131 STAR IN

OUR LOCATION DOES NOT MAKE ANY DIFFERENCE TO OUR COMMITMENT TO SERVE YOU

# 'Unwarranted price controls will ruin drug industry'

The general feeling of the drug and pharmaceutical industry has been reiterated by the chairman of German Remedies at the company's annual general meeting at Bombay on August 3.

The chairman, Mr. H.K. Bilpodiwala has said the new drug price control order (DPCO), which was enacted in 1986, has been very grudgingly and haltingly implemented during the last three years, with the result that the pharmaceutical industry did not get the full expected benefit of that order.

The new government when it came into power last year, instead of implementing the provisions of DPCO, 1987, brought more drugs under price control, which further eroded the profitability of the domestic business.

In fact, a review of the DPCO 1987 has been suggested and further developments will have to be watched to assess the repercussions of government policy on the pharmaceutical industry.

Mr. Bilpodiwala has stated that it is absolutely imperative that the government has some serious thinking on its policy towards the pharmaceutical industry and stops imposing more and more unwarranted price controls and uncalled for restraints on the industry. The unwarranted delay in dealing with fully-justifiable applications for price increases will have a further adverse impact on the profits of the company.

Unless there is a significant change in the attitude and actions of the government, the outlook for the pharmaceutical industry in the domestic market is very bleak. The supply position of important life-saving products will be jeopardised by such government policies and the sufferer will be the public at large. Mr. Bilpodiwala said one more example of government arbitrariness towards the pharmaceutical industry is the recent implementation of demands made on several companies under drug price equalisation account (DPEA).

Referring to the performance of the company, the chairman said during 1989-90, the company introduced a leading international antibiotic.

The new pharmaceutical formulations plant at Goa is on target as for as building progress is concerned. According to plan, it can become operative from April, 1991, but in view of the abysmal attitude of the government towards encouraging the development of the pharmaceutical industry, the company has to slow down this activity.

A number of new products are scheduled for introduction this finacial year. Perhaps the most novel is a product which is an ultra-modern biotechnological product which dissolves blood clots in heart attacks. Towards the end of this year, developments for the production of dipyridamole will have been completed, and this will add to the output at the company's plant at Patalganga.

Mr. Bilpodiwala has said the pharmaceutical industry in India needs to be sufficiently motivated. The first step would be to put into action the applications for revision of product prices which have been kept in cold storage by the present government for a long period.

He said that the company was served with a final notice under the Drug Prices Equalisation Account (DPEA) for the payment of the balance amount of Rs. 46.91 lakhs in respect of the alleged total claim of Rs. 59.95 lakhs in spite of the fact that the company had already paid Rs. 13..04 lakhs in May 1989 as the correct amount payable according to the company.

This balance amount of Rs. 46.91 lakhs had been paid by the com under protest because of the threat fi the Government.

The company had sought legal adv in the matter and would proceed aga that Government for recovery as mi be advised, he added.

---

## BENGAL SMALL DRUT UNIT PLEA TO CENTRE

---

The Government's move to br small-scale drug formulation units w an annual turnover of over Rs. 1 cr under the purview of the Drug Pr Control Order 1987 would place the units in jeopardy.

The West Bengal Small-Scale Dr Manufacturers and Traders' Associati has, in a letter to the Prime Minist Mr. V.P. Singh, said that such a mo would force these units to underta paper and liaison-work for which the do not have the infrastructure.

If at all a decision is taken on the ma ter, the turnover limit should be "rea sonably higher" considering the fa that the Government has recently raise the investment limit for small units t Rs. 60 lakhs from Rs. 35 lakhs. Th President of the Association, Dr. S.K Sen, said employing medical represen tatives on a commission basis should b legalised. This would create additiona employment and take medical facilitie out to remote, areas. It would also further the reach of small drug units.

The association has expressed the fear in the letter that by raising the investment limit to Rs. 60 lakhs, small drug units will come under direct attack from large and medium units.

It has said that the marketing arrangements, loan license agreements and organisational set-ups which spring from collaboration between large drug units and multinationals and small drug formulation units should be prevented by a legislation.

For **IMPORT** of following Products

**(ASC) N-Acetyl Sulphanilyl Chloride (Japan)**

(Important High quality intermediate for Sulpha Drugs & Vinyl Sulphone.
Also to avoid use of Chlorosulphonic Acid and pollution problem)

- Isobutyl Benzene
- Bisphenol-A (Japan)
- L-Lysine Feed & Pharma Grade
- DL-Methionine Feed Grade
- Various other Amino Acids
- Epichlorohydrin
- Cellosolve/Carbitol
- Furfuryl Alcohol
- Beta Naphthol
- Beta Picoline
- 3-Cyanopyridine
- Perchloroethylene
- Ethoxylated Nonyl Phenol 9.5 Mol (Emulsifier)
- N,N-Dimethylaniline
- Dimethyl Formamide
- Diethyl Sulphate
- Cyclohexanone
- Rangolite
- Phenol
- TDI/MDI
- Naphthalene Crude
- Iodine Crude (Japan)
- Propylene Glycol
- Acrylamide
- Thiourea
- Pyridine Pure
- Guanyl Thiourea
- Morpholine
- Sorbic Acid
- Thioglycollic Acid
- Gamma Picoline
- 4-Cyanopyridine
- Meta Nitro Acetophenone
- Ortho Anisidine
- 2-Chloro Propionic Acid
- 2-Ethyl Hexanoic Acid
- N,N-Diethylaniline
- Para Chloro Benzoic Acid
- Ethyl Cyano Acetate
- Ortho Chloro Aniline
- Aniline (Japan)
- Polyol

and various other Industrial chemicals/intermediates/fine chemicals pharmaceuticals etc.

Please Contact the Indenting Agent:

PACIFIC

**M/s. PACIFIC AGENCIES**

41, Prospect Chambers Annexe, 3rd Floor, 317, Dr D N Road, Bombay 400 001
Telephone: Office: 2044482/244923/232833
Residence: Mr. Lathi 5113387 Mr. Vyas 5121909
Telex: 011-86799 PCFC IN

# Duty drawback rule relaxed

The Union government has liberalised Rule 7A of the Customs and Central Excise Duty Drawback Rule, 1971, and has allowed duty drawback to even those exporters in whose case the amount of drawback is less than two per cent of f.o.b.

However, according to Notification No. 43/90-Customs dated July 23, 1990, the total amount of drawback per shipment in such cases should exceed Rs. 10,000.

Rule 7A of the Customs and Central Excise Duty Drawback Rules, 1971, stipulates that no amount or rate of drawback would be allowed either as all industry rate or under brand rate if the same works out to less than two per cent f.o.b.

The above provision was made with a view to bringing under control the volume of applications for drawback either under brand rate or under all-industry rate by eliminating such cases where the claims are of negligible amount.

An official press note, issued at New Delhi on Aug. 9th, says considering the number of representatives made by the Trade and Export Promotion Councils that regular exporters effecting exports of a very high f.o.b value are being denied drawback of considerably high magnitude.

In view of this restriction of two per cent of f.o.b. value, the Government has considered liberalisation of Rule 7A of the Customs and Central Excise Duty Drawback Rule, 1971 by issuing Notification No. 43/90-Customs dated July 23, 1990 and have made the exporters eligible of duty drawback where the amount of drawback is less than two per cent but the total drawback per shipment exceeds Rs. 10,000.

---

## AIPMA CHIEF INVITED TO PRESENT KEYNOTE ADDRESS AT PLASTRADE CONGRESS

Australia has invited Shri Vijay V. Merchant, President, All India Plastics Manufacturers Association to deliver the Keynote address at the forthcoming **International conference on Trade & Investment** in the Asia Pacific region, which is a signal honour for India. This shows the growing interest the other Asian countries are now showing in developing trade & investment with India in the coming decade.

The conference is to be inauguratged by the Prime Minister of Australia, Mr. Bob Hawke and is expected to be one of the largest ever held with almost 3000 delegates from SouthEast Asia connected with Plastics, Petrochemi
Trade & Finance.

Leaders of Trade & Industry f
sixteen nations including Japan, Ko
Taiwan, China, Thailand, Malay
Singapore, Indonesia, Hong Kong
will be deliberating at this meeting
exploring opportunities for new inv
ments and increased trade in the reg

AIPMA has planned to project
new skills and capabilities of the Inc
plastics industry, the tremendous po
tial for new investments in downstre
projects as also the huge Indian mark

A high level delegation comprising
leading personalities from the Ind
plastic industry (Exporters, Import
(Technocrats) besides machinery m
ufacturing, managers of petrochem u
and leading State Development Cor
ration heads are expected to join
Indian delegation and participate. T
could open up new avenues for seve
enterprises and institutions and s
development in the Indian plast
industry in the decade of the 90's.

The scope for the increased trade a
commerce is estimated to be enormo
besides initiating NRI investmen
joint venture projects and transnation
participation in capital intensive pe
rochem projects in India in hard cu
rency.

Available from ready stock:

MANGANESE SULPHATE, MAGNESIUM SULPHATE, ZINC SULPHATE, MAGNESIUM CARBONATE, MAGNESIUM OXIDE, MANGANESE CARBONATE, NICKEL SULPHATE, NICKEL CHLORIDE, DIAMMONIUM PHOSPHATE, SODIUM HEXA METAPHOSPHATE, AMMONIUM CHLORIDE, FORMALDEHYDE, ACETIC ACID, FERROUS SULPHATE, FERRIC CHLORIDE, SODIUM ACETATE, COPPER SULPHATE, ZINC OXIDE, BORAX, BORIC ACID, SODIUM SULPHATE, POTASSIUM NITRATE, and SODIUM META SILICATE.

Please Contact:

ANANDHALAKSHMI CHEMICALS
90, Rasappa Chetty Street, Park Town, Madras 600 003.
Phone: 566888

# NIN disproves claims on vitamin A

Claims by drug cartels that vitamin- reduces mortality among children ve been disproved by studies at the tional Institute of Nutrition (NIN) in yderabad.

Such claims are propagated to boost les of vitamin-A in the third world, ys Dr. C. Gopalan, former director of N and President of the Nutrition undation of India.

India imports all the vitamin-A for its indness prevention programme. Forgn drug firms are now seeking to rther promote its sales by claiming at vitamin-A is also a remedy to duce infant mortality, Dr. Gopalan ys.

The sales pitch is based on an isolated nall study in Indonesia by American seachers who claimed that vitamin-A rought down child mortality by 30 per ent.

The NIN Director, Dr. Vinodini eddy said, that her institute found sevral loopholes in the study and said that he results were not dependable.

An independent study by NIN has onfirmed that vitamin-A, while being seful in preventing blindness, plays no ole in reducing mortality rates.

The one-year double-blind study was carried out by NIN on 18,000 children in Nalagonda district of Andhra Pradesh.

"Our results are contrary to those reported from Indonesia and indicated that vitamin-A per se will not reduce morbidity and mortality in children," Dr. Reddy said.

Any reduction in mortality rates noticed was entirely due to the more frequent contacts that health workers had with the children during the study period, she said. Rather than depending on vitamin pills from drug stores, children could get all the vitamin-A they need by eating the right food and vegetables, she said.

This is the new approach by NIN which has launched the "nutrition garden" project in co-operation with the Horticulture Department of the Andhra Pradesh Agricultural University.

A garden in the backyard of NIN, where several vitamin-A rich vegetables and legumes are being grown is being used by NIN as a model for homes in villages.

The nutrition garden approach is being promoted in Narasapur, Adilabad and Ananthapur centres.

One gram of spirulina algae per day would be sufficient to meet vitamin-A requirements of children, Dr. Reddy said. Pappaya and a vitamin-A rich spinach identified by NIN are among some 20 plants selected for the nutrition garden. Dr. Reddy said NIN is also promoting crude palm oil as a source of vitamin-A. Imported palm oil does not contain this vitamin.

---

## IIChem.E OFFICE BEARERS

In the Annual General Body meeting of Indian Institute of Chemical Engineers, Ahmedabad Regional Centre held on 21st July 1990, the following were elected members/office bearers of the Executive Committee for the year 1990-91.

Mr. A.K.A. Rathi — Chairman, Mr. H.L. Khar, — Vice Chairman, Mr.D.J. Desai — Hon. Secretary, Mr. M.L. Agarwal — Hon. Treasurer, Mr. S.S. Nayak — Hon. Jt. Secretary, Dr. M.C. Chhabria — Past Chairman, and Dr. C.M. Ramaswamy, Prof. R.N. Shukla, Mr. Manish Patel, Mr.H.R. Shah, Mr. C.G. Baagchandani, and Mr. F.B. Virani, as members.

FOR ATTRACTIVE CIF PRICES OF

PHENOL OFF GRADE
& USP
CYANURIC CHLORIDE
SODIUM METAL

Contact:

FLUORODYECHEM

Swagat Co-op. Housing Society,
Building 3/A, Block No. 1,
"Damodar Park",
L.B.S. Marg, Ghatkopar,
Bombay 400 086.
Phone: 581958/587264
Cable: FLODYES
Telex: 011-75806 FLOR-IN

### INDUCTING POLLUTION-FREE KNOWHOW

# UNEP calls for additional aid

A resolution has been passed at a special session of the governing council of the UN environment programme at Nairobi which will provide new "and additional" financial and technical resources to the developing countries to enable them to meet the cost of switching over to pollution-free technologies.

Forty-eight countries voted for the resolution and one against. One country abstained from voting.

The resolution is a landmark on environment matters. There was an initial hesitation, but according to an official news release, with forceful arguments and hectic lobbying, all the developed countries, except the US, were convinced in favour of the resolution.

The Indian delegation to the session was led by the minister for environment and forests, Mr. Nilamani Routray.

The governing council (GC) also decided that the proposed convention on biological diversity would now address wider socio-economic issues, particularly relevant to the developing countries.

The Indian delegation drew attention to the fact that while modern technologies for the preservation and enrichment of biological diversity are available in the developed countries, the world's richest bio reserves are found in the developing countries.

India's suggestion, that there should be a constant review of recent agreements, such as Montreal protocol, was welcomed by the GC and adopted in one of the resolutions.

The GC also ageed to review the adequacy of the resolution on transboundary movement of hazardous wastes, appreciating the urgent need to assist the developing countries in identifying and analysing the environment impact of such wastes.

Expressing India's main concerns, Mr. Routray stated at the session that traditional needs of the developing countries have to be addressed on an equal footing with global problems like ozone depletion and climatic changes.

He cautioned the international community against rushing into legal agreements on highly complex issues such as biodiversity and greenhouse effect.

---

## DEEMED EXPORTS TO GET FULL CCS

Deemed exports would be entitled to cash compensatory support (CCS) on par with that granted to physical exports.

In a policy package being worked out by the Government, the deemed exports would also be taken into account for calculating the threshold limits of the star, trading and export houses.

The package has been agreed to by the Secretaries of Finance, Commerce and Industry, it is reliably learnt.

The move is primarily aimed at encouraging the indigenous suppliers and simultaneously in saving foreign exchange.

With this aim in mind the Commerce Ministry had recently granted deemed export status to the indigenous manufacturers of capital goods effecting their supplies to exporters who are willing to undertake three times export obligation of the total value of machines purchased by them.

At present deemed exports are entitled to CCS which is 75 per cent of the CCS granted to physical exports. It has also been decided to streamline the procedures for the certification of deemed export status. The proced at present are tough and lengthy.

The Ministries of Finance and C merce have also initiated an exercis work out the CCS rate for several it which could be eligible for the deer export status. The Finance Ministr also working out the burden.

The sudden crunch felt in fore exchange reserves got the Governm looking at indigenous suppliers.

However, not all products supplie exporters can acquire the deemed exp status.

Hence in cases where the supplies made to an exporter who is willing undertake an export obligation, Government grants the deemed exp status.

As per the policy the indigenous p ducer of any item supplying the sa to a holder of the duty-free licence a if the said item is permitted for imp on the said licence, such supplies also taken as deemed exports.

According to the existing policy t status would be given on the conditi of discharge of export obligation, if an imposed on the indigenous produc under the capital goods industri licence or approval of foreign collabo tion.

The sales made to foreign tourists a also eligible for the deemed expor status if the payment is received in fo eign exchange.

However, the procedure to be fo lowed to acquire the status is very cum bersome. According to the curre thinking, the entry by the deeme exporter in the books of actual expor ers and vice versa should be enough fo claiming incentives under the deeme export status.

# FY project plan in Bengal being recast

he proposal for the joint sector pol- er filament yarn project, to come up orjora in Bankura district, is being stantially recast.

he promoters, West Bengal Indu- al Development Corporation and iance Industries Ltd., are initiating ropriate steps to upscale the project acity to 25,000 tonnes from the letter intent capacity of 15,000 tonnes ich for over three years had been the is for WBIDC's occasional negotia- ns with its erstwhile partner, the S.K. la group.

According to highly placed sources, second major deviation being con- nplated by WBIDC and Reliance ates to the selection of the foreign hnical collaborator. The S.K. Birla oup had tied up with Teijin of Japan. e promoters now intend to float obal tender and select a party which ll offer state-of-the-art technology at most competitive terms.

WBIDC's MoU with Reliance, gned on March 5, 1990, spoke of an vestment of nearly Rs. 200 crores for ,000 tonne PFY project. According to ntative estimates, the project might cessitate, because of the proposed scaling to the minimum economic ze of 25,000 tonnes, an investment wards of Rs. 250 crores.

The debt equity ratio is to be 2:1 and eliance will discharge its equity obli- ations (just under 25 per cent) from ternal accruals. The lead financial stitution is Industrial Development ank of India.

The change in joint sector partner, apacity and possibly technical colla- orator will warrant securing several resh approvals from the Centre. The Vest Bengal government and WBIDC re moving in that direction. But nearly inalised is the name of the company vhich will implement the project. Bar- ing a last minute change, the company will be christened Reliance Bengal Industries Ltd.

The approach to the project and the steps to be gone through before fixing the zero date were the subjects of a high-level meeting at Calcutta recently.

The project also figured in the discussions the Reliance supremo, Mr. Dhirubhai Ambani, has had with West Bengal Chief Minister Mr. Jyoti Basu recently. Mr. Ambani is reported to have assured Mr. Basu that he was keen on starting work on the project at the earliest. For assessing the infrastructure requirements, Mr. Shiva Prasad Chakravorty, group president of Reliance Industries, recently visited the site.

According to available indications, the two sides will follow up the March 5 MoU with a comprehensive agreement soon.

## J.K. SYNTHETICS PLANS MAJOR OVERHAUL

J.K. Synthetics Ltd., the Rs. 800-crore Kanpur-based company, is planning a major overhaul of its works in various divisions in a bid to make its staff more productive.

These corrective measures are being taken to tide over last year's unsatisfactory performance, according to highly placed company sources. The thrust of the exercise is to remove the deadwood in the company's various divisions and streamline the functioning of the company.

Those found redundant in a particular division would be transferred to other divisions or offices where their productivity could go up, the sources said.

The company has, however, rule out large scale retrenchment. The basic aim is to make the system more responsive. With these changes, the company hopes to put up a better performance this year. Last year was a bad one for the company. The problems of the company stemmed from the lock-out in its Consultancy and Engineering Division at Badri, which houses the Jai Kay Tech Division and its engineering unit. Another hurdle last year had been stabilising the new acrylic fibre and tyre cord project at Jhalawar.

As a result of these various drawbacks, the company had earned a net profit of only Rs. 11.18 crores on a turnover of Rs. 764.52 crores with an equity capital base of Rs. 38 crores in 1988-89.

This year the company hopes to expand its present acrylic fibre capacity by 8,000 tonnes. However, the president said that the competition in acrylic fibres would be fierce as there was glut in the market at present. The only solution was diversification of the product-base.

Mr. Rustagi said the costs of some synthetic fibres had been changed recently. This type of change in costs of certain fibres will not help the industry, he added. The government should take the problems of the whole industry into account before changing the cost structure of a few items.

The cost structure of various units were different and therefore, the costs of synthetic fibres should be taken only after consultation with the whole industry he pointed out.

## SARABHAI CHEMICALS

The power supply to Sarabhai Chemicals, a division of Ambalal Sarabhai Enterprises Ltd. which was disconnected by the Gujarat Electricity Board on July 31, 1990, was restored on August 4 and full production is being maintained, according to a press note issued by the company. During the four days of power cut, the unit continued production with its own generators

# TPL detergent project may be set up at Karaikal

The Rs. 50-crore phosphate-free detergent project of the joint sector Tamil Nadu Petroproducts Limited (TPL) is likely to be located at Karaikal in Pondicherry in order to derive locational advantage. The company had originally planned to promote the project at the Sipcot chemical complex at Cuddalore, in the backward South Arcot district of Tamil Nadu, but the complex does not seem to have surplus land for locating new projects.

Since the neighbouring Union Territory offers attractive fiscal incentives and has the necessary infrastructure, including adequate power and water, TPL is now toying with the idea of setting up the project at Karaikal. There would also be the advantage of availability of natural gas from the Cauvery basin. Work on the project will commence next month and it is expected to be commissioned within two years. The Union government has already cleared the technical and financial tie-up with Henkel of West Germany, the world's largest detergent manufacturer. However, approval from financial institutions is still awaited.

The plant will have a capacity to produce 30,000 tonnes of detergent cake and powder. For the first time, zeolite will be used, instead of phosphate, as a raw material for making higher performance detergents. Use of phosphates has been banned or restricted in Europe. Henkel has agreed to provide marketing support for exporting 3,000 tonnes of zeolite-based detergents out of the total 10,000 tonnes to be produced. Initially, the plant will absorb about 5,000 tonnes of linear alkyl benzene (LAB) produced by TPL's plant at Manali in Madras. Ultimately, it will utilise nearly 30 per cent of the plant's total L output.

The German company is expecte take 27% of the equity and TPL 2 TPL is hopeful of offering a hi quality and high-performance produc the present price level quoted by de gent manufacturers. It is now dee studying the market to create consu awareness for the new product. This be the first downstream project of T promoted by SPIC and Tamil N Industrial Development Corporatio a cost of Rs. 181 crores.

The company's LAB plant, comm sioned at Manali in the last quarter 1987, has been designed to save fore exchange to the tune of Rs. 100 cror The plant has been maintaining a cap ity utilisation of 100%. The compa has augmented the LAB capacity fr the initial level of 50,000 tonnes 60,000 tonnes as per the minimum ec nomic size. It has plans to reach a le of 80,000 tonnes.

TPL's performance has been redee ing during the 15-month accounti period of 1989-90. Thanks to an aggre sive marketing strategy adopted by t management, the turnover rose Rs. 233.62 crores against Rs. 102. crores in the previous eight-and-a-h months. The gross profit before depr ciation and interest charges was impressive Rs. 66.69 crores (Rs. 34. crores). Provisions included intere charges of Rs. 23.39 crores (Rs. 11. crores), depreciation Rs. 25.67 cror (Rs. 13.04 crores), investment allo ance Rs. 3.75 crores (nil) and taxatio Rs. 2.85 crores (Rs. 1.70 crores). T 15% (10%) dividend paid claim Rs. 7.31 crores (Rs. 4.86 crores). Aft the transfer of Rs. 74 lakhs (nil) to t general reserve, a large surplus Rs. 6.11 crores has been carried fo ward against Rs. 3.14 crores brought i TPL exported 2,000 tonnes of LAB China during 1989 and an order f supplying a similar quantity has bee received from Europe.

READILY AVAILABLE

ACETONE
PHENOL

CONTACT

AROMA CHEMICALS

403, Faiz-E-Qutbi, 375, Narsi Natha Street, Bombay 400 009.
Phones: 344154/330391/323425/333298
Telex: 011-75469 Cable: "DELHICHEM"
Kiran Mansion, 4834/24, Ansari Road, New Delhi 110 002.
Phones: 3275955/3275956 Resi.: 2510057
Telex: 031-61441 SCBP IN

# PL's LAB complex dedicated to nation

The Chief Minister of Tamil Nadu, ri M. Karunanidhi formally inaugurd the linear alkyl benzene (LAB) mplex of the Tamil Nadu Petroprocts at Manali. The occasion also saw e commissioning of the heavy normal raffin (HNP) unit and the captive wer plant.

Mr. M. Karunanidhi, expressed the ope that the steps being taken by the overnment would help Tamil Nadu egain its lost glory in industrialisation nd enable it to soon occupy the top osition in the country.

The Government would encourage ndustrialists, including those from other tates, to invest in Tamil Nadu and at he same time involve the workers in the rocess of industrialisation, he said.

Mr. Karunanidhi said soon after he assumed office he had taken a number of steps to overcome the slackness in ndustrial growth in the last decade. The Government had constituted a high-power committee to examine and suggest ways for rapid industrialisation of Tamil Nadu.

Besides, he had also held meetings with industrialists of Tamil Nadu and those from other States. He had assured the entrepreneurs that the Government would provide all facilities for them to invest in the State.

"In the last two years, after the initiative taken during the President's rule, the incentives offered by us has led to more and more industries being set up in the State. This function itself is a testimony to that", the Chief Minister said.

### Aromatic project

He renewed his plea to the Centre to sanction the proposed aromatic project to Tamil Nadu. He had held discussions with the Union Petroleum Minister, Mr. M.S. Gurupadaswamy, and the Prime Minister, Mr. V.P. Singh, regarding this. "Uttar Pradesh is also bidding for this project and they want to set it up at Salimpur. I am taking all efforts to ensure that Tamil Nadu gets the project."

The Chief Minister said the "letter of intent' had been issued to Tamil Nadu even before Uttar Pradesh staked its claim for the project. "I want to remind the Centre of this", he said.

Mr. Karunanidhi said some States started their projects even before they got the approval of the Centre. "But, as we follow the procedure, we are waiting for the approval to start the project. I hope the Centre will give its approval soon", he said and added that with the help of the Governor it would be accomplished.

### Rs. 18 crore project

Welcoming the gathering Mr. R. Nagarajan, Home Secretary and Chairman of the company, said the project cost was Rs. 181 crores. The HNP unit had been set up at Rs. 5 crores. Captive power plants for 12 MW had been set up at Rs. 9 crores.

Tamil Nadu Petroproducts is a joint sector project set up by TIDCO and SPIC with technology supplied by UOP Inc. and engineering services supplied by Uhde India Ltd.

Mr. A.C. Muthiah suggested that the Government constitute a separate body for providing infrastructure requirements of Manali, which faced water shortage and acute power crisis. He wanted the Goverment to have a consortium for power projects, and sanction water recycling plant.

Mr. Ken Blaine of UOP Inc., London, and Mr. Duemmler of Uhde India, congratulated officials of the company for successful completion of the project. Mr. P.S. Balasubramanian, Managing Director of Tamil Nadu Petroproducts, proposed a vote of thanks.

CONTACT FOR

**FILTER CLOTH**

MFG. : - ALL TYPES OF POLYPROPYLENE, COTTON, NYLON, NONWOVEN FILTER CLOTH, FIBER GLASS CLOTH & INDUSTRIAL CLOTH

SUPPLIERS :- ALL TYPES OF CENTRIFUGE BAGS, FILTER PRESS PIECES, NUSTCHES AND PULVARISER BAGS.

**MECH - TECH**
**INDUSTRIES**

FACTORY :-
22 A/B, ARCHANA ESTATE
OPP. AJIT MILLS, RAKHIAL,
AHMEDABAD-380023

OFFICE :-
11, HIRAN CLOTH MARKET,
2ND FLOOR, REVDI BAZAR,
CROSS LANE, AHMEDABAD

PHONES: (F) 360302 (O) 343533 (R) 407264

H.V. SHAH

### CAPROLACTAM PROJECT COMMISSIONING:

# FACT misses deadline again

Fertilisers and Chemicals Travancore Ltd. (FACT) was supposed to commission its plant on July 17 but failed to meet its self-imposed deadline once again.

The caprolactam plant is now expected to go on stream in early 1991. FACT will be the second domestic manufacturer of caprolactam after Gujarat State Fertilisers Corporation (GSFC).

GSFC produced 20,000 tonnes in 1989-90. Of this 7,000 tonnes were available for domestic users and the remaining used for Gujarat Nylons promoted by GSFC.

Indian mills are therefore forced to import most of the caprolactam requirements. In 1990 caprolactam imports touched 80,000 tonnes.

A caprolactam plant takes between three to four years to stabilise. The FACT plant will supply 5,000 tonnes of caprolactam for the first few years and gradually increase this to 7500 and finally 10,000 tonnes. It is expected to utilise 80 per cent of its capacity by 1994-95.

Nylon producers, the only users of caprolactam, have asked for an increase in import licences for caprolactam to meet unfulfilled domestic demand. GSFC prices caprolactam at Rs. 39 per kg. and the landed cost of imports is Rs. 63.

The FACT plant is expected to ease supply shortages. Meanwhile the government has allowed imports against replenishment licences. Users can purchase import entitlements from the market at a premium.

GSFC itself plans to expand its caprolactam production but domestic users fear that most of it will be used by Gujarat Nylons. Caprolactam demand for 1990-91 is expected to cross 1.91 lakh tonnes. This is higher than the combined installed capacities of GSFC, FACT and the planned Bihar State Industrial Development Corporation (BSIDC) plant.

The memorandum of understanding for the BSIDC plant was signed in October 1987. The project, a joint-venture between BSIDC Steel Authority of India Ltd. (SAIL) and Shriram Fibres Ltd. (SRF), is yet to get off the drawing board. Hence the user industry will have to continue to import 80 per cent of its requirements through the next decade.

Major users of caprolactam are nylon tyrecord (NTC) producers and nylon filament yarn (NFY) manufacturers. NTC producers complain about the quality of indigenously produced caprolactam supplied by GSFC. They are forced to use blends of indigenous and imported caprolactam in a ratio of 20:80.

GSFC is the only domestic producer of caprolactam today. The plant was commissioned in 1974 at a cost of Rs. 35 crore and managed to attain 100 per cent capacity utilisation by 1986. If its expansion plans come through annual production can touch 50,000 tonnes.

---

### BICP COST STUDY ON CAPROLACTAM LIKELY

The Bureau of Industrial Costs and Prices (BICP) may soon be asked to conduct a cost study on caprolactam along with that for nylon filament yarn. Earlier, nylon spinners had requested the authorities to make a cost study of caprolactam, but now they have stressed the need for carrying this out on an urgent basis in view of the reported move by GSFC to hike further the caprolactam price shortly. They feel that it wo
also facilitate BICP to work out a f
selling price for nylon yarn as well

The issue of a further increase in t
price of caprolactam by GSFC h
come up for discussion at the meeti
of representatives of nylon spinners a
those of art silk weavers from Su
convened by textile commissioner M
Arun Kumar in Bombay on July 31

The meeting reviewed the prices a
availability of NFY in relation to t
maximum prices for different denie
fixed by the textile commissioners.

It was decided to review the price
again in case GSFC decided to raise th
price of caprolactam. Till such tim
both the spinners and weavers hav
decided to maintain the present pric
levels.

The question of some NFY supplier
charging premium was discussed at th
meeting. Weaver's representative
stated that they had not received an
complaints from their members so fa
and even the textile commissioner'
office has not been approached by an
consumers in this connection. The textile commissioner, however, asked the weavers' representatives to bring to his notice the violation of price control, if any.

The weavers felt that the availability of 28/6 and 20/6 deniers was not adequate and its supply should be increased. The spinners, however, stated that while fixing the prices these deniers had not been given adequate hike to compensate for the cost escalation, which discouraged them from increasing their production.

Further, these two deniers account for 40 tonnes out of the monthly supply of around 2,000 tonnes of NFY to Surat weavers. Out of 40 tonnes, 25 tonnes are supplied by spinners to the weavers association and the balance is directly supplied to the customers.

**Unichema International**

(UNILEVER GROUP)
Vest Germany/Holland/U.K./Australia/Malaysia
OFFERS:

or **LUBRICANT INDUSTRY**
- Hindered Esters (Fully Synthetic)
- Non Hindered Esters (Fully Synthetic)
- Antiwear/Lubricity Improvers
- Anticorrosion Additives
- Surface Active Agents

for **POLYOLEFIN INDUSTRY (PLASTIC ADDITIVES)**
- Stearamide
- Erucamide
- Oleamide
- Ethylene-Bis-Stearamide
- Stearic Acid
- Glycerol Mono-Oleate
- Glycerol Mono-Stearate

For imports into India and further details
Please Contact:
**AGENTS IN INDIA**

**soofi enterprises**

1317, Dalamal Tower, 211, Nariman Point,
Bombay 400 021.
**Tel. Nos.: 224689/233074**
**Tlx. No.: 0118-4187 SUFI IN**
**Cable: SOOFICHEM**
**Fax No.: 2047657**

**We also offer:**
**LACTOSE I.P.**
**GUM ROSIN (WW & WG GRADES)**

For Your Requirement of:

- SODIUM CARBOXYMETHYL CELLULOSE (Cepol/Cellpro)
- SODIUM ALGINATE (Algogel)
- ALGINIC ACID
- CALCIUM, POTASSIUM AND AMMONIUM ALGINATE
- MICROCRYSTALLINE CELLULOSE POWDER (MCCP)
- CELLULOSE POWDER
- MONOCHLORO ACETIC ACID (MCA)
- SODIUM MONOCHLORO ACETATE (SMCA)
- METHYL CHLORO ACETATE (MEMCA)
- ETHYL CHLORO ACETATE (ECA)
- ISOPROPYL CHLORO ACETATE (IPCA)

Manufactured by:

**CELLULOSE PRODUCTS OF INDIA LIMITED**

Contact:

**OM NEELKANTH DRUGS & CHEMICALS PVT. LTD.**

A-11, Neelamber Complex,
Near St. Xavier College Corner, Navrangpura,
Ahmedabad 380 009.
**Tel. No. 468991**

85-C, Mittal Tower, Nariman Point,
Bombay 400 021.
**Tel. No. 224636 / 232267**

3B/6-7, Tirathram Building, Asaf Ali Road
New Delhi 110 002.
Tel. No. 3262481

# ONGC feedstock for MGCC by month-end

The gas fractionation facility of Oil and Natural Gas Commission (ONGC), which is to provide the feedstock for Indian Petrochemicals Corporation Ltd. (IPCL)'s, Maharashtra Gas Cracker Complex (MGCC) at Nagothane, is to be commissioned this month-end.

ONGC has already loaded hydrocarbons in its gas fractionation plant at Uran, and production is expected to commence within two weeks. It is learnt that Mr. K.N. Venkatasubramanian, chief of Engineers India Ltd., visited Uran recently and was satisfied with the progress. No one expected regular commissioning of the cracker based on C2, C3 fractions before October-November. Thanks to expeditious work at Uran, ethylene production is now expected to resume in September.

ONGC has put up a tent above the plant to expedite work despite the rains. If unforeseen events delay its commissioning, IPCL management is prepared to have a second run of the cracker based on LPG. Talking to *The Economic Times*, Mr. Hasmukh Shah, IPCL Chairman and Managing Director, refuted the suggestion that the Nagothane plant was held up for want of feedstock. He said that the department of petroleum and natural gas has made adequate allotment of LPG. IPCL officials, however, wanted to build up capacity in a phased manner and did not want to take chances in the rains, he said. Its officials are now engaged in the task of reactivating the vessels lying in the open.

The Nagothane gas cracker, India's first, was commissioned on June 14 based on LPG from Uran, as a stopgap arrangement. ONGC's Uran plant is to supply 4.5 lakh tonnes a year of ethane and propane, which is to be supplemented by 51,000 tonnes of propane from Bharat Petroleum Corporation Ltd.'s Mahul refinery. Meanwhile, two proposed new gas crackers are coming up for pre-public investment board (PIB) clearance later this month. One is IPCL's Gandhar petrochemical project in Gujarat. The second is Gas Authority of India Ltd.'s project at Auraiya in Uttar Pradesh. The Gandhar project will be based on ONGC's gas fields in Gandhar. The ethane-rich gas will feed the petrochemical project, while the lean gas will feed gas-based power plants in the state.

The following are the products proposed to be manufactured in Gandhar, with the approximate cost given in brackets: ethylene 3 lakh tonnes (1000 crores), PVC 1.5 lakh tonnes (400 crores), EO 20,000 tonnes and MEG one lakh tonnes (Rs. 350 crores), alpha olefins one lakh tonnes (Rs. 400 crores), primary alcohols one lakh tonnes (Rs. 250 crores) and minor other products (Rs. 200 crores), together totalling Rs. 2,550 crores.

GAIL had earlier estimated a cost of Rs. 1,560 crores for its project which will crack Bombay High gas transported through the HBJ pipeline. GAIL proposed to raise half the cost through internal resources and another half through borrowings and public sector bonds. It is proposed to have a 1:1 debt equity ratio. This project will have a capacity of three lakh tonnes of ethylene and the product range will be similar to the IPCL project at Nagothane.

## BENGAL TO EXPLORE TRANSFER OF KNOW-HOW TO HALDIA

The West Bengal Government will explore the possibility of transfer of technology from certain State-run and private sector petrochemical companies in the country pertaining to Haldia Petrochemicals Ltd. (HPL) soon. Mr. Bikram Sarkar, State Commerce and Industries Secretary, said that a committee of experts would shortly visit a few States for technology transfer. Although he did not say it in so many words, it is likely that Indian Petrochemicals Ltd. (IPCL) and a few promin industrial houses would be approach The State Commerce Secretary, ho ever, declined to elaborate on the iss until the exact product mix of the pr ject is finalised.

Technocrats are currently bu thrashing out the specifics of small-sca sector involvement in the downstrea units of the project. According to M Sarkar, it is normal for the minimu economic size (MES) of a project change over a period of time. HPL, h said, would succeed in establishing unique link between the small and larg sectors and would start a chain of lin kages which would extend beyond i geographical confines.

The Commerce Secretary said that i keeping with the new thinking of th Central Government, the West Benga Government would also throw open it gates to more private investment in the power sector. To combat the infrastructural problems in the State, some roads would also be privatised on an experimental basis. The Government would write to chambers of commerce in Calcutta soon in this regard. According to Mr. Sarkar, private participation is needed not only in power generation but also in its transmission and distribution. "The private sector is an equal partner in the development process", he added.

## HALDIA PETROCHEM: BID TO BAG CRACKER CONTRACT FOR L & T

Mr. D.N. Ghosh, Chairman of Peico Electronics and Electricals Ltd., who masterminded the strategic alliance between Peico and the Tatas, is now looking up to Haldia Petrochemicals Complex for bagging the prestigious naphtha cracker contract for Larsen and Toubro. Sources close to Mr. Ghosh point out that he is interested in the Haldia project, and is in fact expected to call on the West Bengal Chief Minister shortly to make out a strong case for L and T.

# Bijaipur petrochem project cleared

he environment and forest ministry cleared the controverisal Bijaipur ochemical project.

stimated to cost Rs. 600 crores, the ject is being set up by the public tor Gas Authority of India Ltd. AIL) for producing 1.08 lakh tonnes annum of propylene and 1.10 lakh nes polypropylene.

GAIL proposes to set up facilities for pane dehydrogenation and manufac- e of polypropylene. This technology considered to be complex and only such plant has been set up recently Thailand using this technology. A m is proposed to be sent to Thailand evaluate the technology.

The environment ministry has stip- ted that gaseous emission of sulphur oxide, oxides of nitrogen, hydrocar- n etc. should at no time exceed the ximum permissible limit prescribed the central and state pollution con- l boards.

Similarly, the amounts of effluents nerated from the cooling tower blow wn must be recycled fully first as oling water. The effluents generated m other sources should by recycled the extent of 95 per cent either as pro- ss water or for afforestation. The ated effluents must conform to the nimum standards before their dis- arge into chopan nullah.

The solid waste generated in the plant ould be disposed off in a suitably ed pit. The project authority must set a minimum of five mechanical eather monitoring stations and five tomatic air quality monitoring stations and around the plant premises after tailed modelling exercise, for measur- g short term ground level concentra- on.

At least eight effluent water quality onitoring stations at each plant source well as at various points up stream and down stream of chopan nullah should be provided and recorded data must be furnished to the state board once in three months and to the ministry every six months.

It has also been stipulated that a 300 metre wide green belt should be provided around the plant within its boundary with compatible species and should be at the rate of 1,000 trees per acres.

---

## UCL PLASTICS' EXPANSION PLANS

UCL Plastics Ltd. has chalked out major expansion plans to avail the good growth opportunities available with the company. It plans to invest around Rs. 10 crores in the next two years in two phases. With the demand of its products growing rapidly, it is concentrating right now on investing in the field of plastics and related lines only. The company will be launching some new products for the first time in the country.

In the first phase, tne company has decided to double the capacity of stretch blow moulded bottles from present level of six lakh bottles per annum to 12 lakh bottles, by putting up another plant in Noida. It has already acquired land for the purpose. Investment in this phase will be Rs. 250 lakhs, including the cost of investments in balancing equipments to increase the efficiency of the plant.

The company will get three major benefits on commissioning of this plant — economies of scale, sales tax exemption for another eight years and locational benefits as the major customer of stretch blow moulded bottles. Parle has also put up its plant in Noida. It is also putting up its own PVC compound manufacturing unit the base raw material for bottles, for captive use, which will result in reducing the cost of raw material consumed by 25 per cent.

For your Requirements of:

ACETATE ▫ CARBONATE
CHLORIDE ▫ CHROMATE ▫ DIOXIDE
HYDROXIDE ▫ NITRATE ▫ OXIDE ▫ PHOSPHATE
SULPHATE Etc.
— OF —
CADMIUM ▫ COBALT
COPPER ▫ LEAD ▫ NICKEL
MERCURY ▫ STANNOUS (TIN-II) ▫ ZINC
AND OTHER INORGANIC CHEMICALS

AMMONIUM BI CHROMATE TECH, PURE & EXTRA PURE
POTASSIUM BI CHROMATE A.R. AND
POTASSIUM CHROMATE.

ACE CHEMICALS

Bombay Sales Office
A-1, Sahyadri, Pandurang Wadi,
Goregaon (East), Bombay-400 063.
Tel. 6882232 ▫ 6882614

Regd. Office & Factory:
Plot No. N-11, M.I.D.C.
KUPWAD-416 425
Dist Sangli, (Maharashtra).

Print Design

### ASSAM GAS CRACKER PROJECT

# MacNeill & Magor seeks co-promoter status

MacNeill and Magor, one of the blue-chip companies operating 54 tea gardens in Assam, has submitted its proposal to the government of Assam for the status of co-promoter in the proposed Assam gas cracker project being set up at a cost of Rs. 2,300 crores.

The involvement of MacNeill and Magor in the proposed gas cracker project started when the chairman of the company, Mr. B.M. Khaitan, had a meeting with the chief minister of Assam, Mr. P.K. Mahanta, and the industries minister, Mr. G.N. Hazarika, in Delhi last May.

Mr. B. Nangrani, president, project division of MacNeill and Magor, accompanied by Mr. V. Vamchi, vice-president, corporate planning, and Mr. G.P. Barua, vice-president, personnel and administration, called on the Assam chief minister recently and formally submitted the company's proposal. The team handed over a letter from the company's managing director, Mr. D.N. Khaitan, addressed to the chief minister which said, among other things, "we have now had an opportunity to discuss an outline of the project and confirm that the MacNeill and Magor group is interested in a joint venture with AIDC.

It is crucial for the success of the project that the government of Assam plays a major role in the promotion of this core sector venture. We would, therefore, suggest that the project be implemented in the joint sector". Mr. Khaitan, in his communication, stated that the group had a happy association with Assam for almost a century by virtue of the tea interest located in the state and it would be in keeping with that spirit for the company to associate with the first gas cracker project to be set up in the state.

The project will generate considerable employment as also add to the prosperity of the state.

Mr. Hazarika, while expressing satisfaction over the interest shown by the tea company in the project, said that a few other industrial houses had also shown interest in the project. He added that a committee would be set up shortly to finalise and short-list the joint sector partners for the project.

Mr. Nangrani said that the Assam gas cracker project, when implemented, would impart a new dimension to the industrial development of the state and MacNeill and Magor would like to avail of the opportunity to become a partner in the process.

MacNeill and Magor's proposal appears to be the first instance in Assam of a tea company's efforts at diversification. Earlier, the company had exhibited interest in investing around Rs. 60 crores in Assam in ventures outside tea for which they had collected data from the state government. Nearly 16 industries had been identified for the purpose by Tata Consultancy Services. But MacNeill and Magor's latest thinking on increasing their extra-tea investments despite the current atmosphere of uncertainty and unrest prevailing in Assam, is seen as a very encouraging step for the people of the state.

The group has a high stake in the Assam tea gardens and cannot, under any circumstances, afford to pack up. So, it is, perhaps, judicious for it to diversify into more rewarding areas like petrochemicals while they carry on their pursuits in tea smoothly.

If the company's proposal comes through, it will, as co-promoter, have to concern itself with the expenditure of setting up a gas separation plant. The Government of India has allocated an
amount of Rs. 150 crores for the
aration plant in addition to Rs. 2,
crores for the gas cracker project u
the Eighth Plan. But, evidently,
amount earmarked for the separa
plant will prove inadequate and it
have to be assigned to Oil India or
such producing agency.

## GOA NYLON PLANT UNDER SCRUTINY

The Goa Assembly House Com
tee set up under the chairmanship of
Anant N. Naik, former Industries Mi
ter to inquire into the irregularities ab
possession of land from Querim Co
municade in Ponda for the nylon 66
tory, has invited suggestions, comme
from persons interested in the said m
ters.

The committee will also investig
into the pollution aspects, permission
the licence given to the factory and
other related matters. The Nylon 66 p
ject is a joint venture between the E
nomic Development Corporati
(EDC) of Goa, Ballarpur Industr
Ltd., of the Thapar group and EI DuP
de Nemours and Company, USA.

The plant will be at Kerim Plate
where EDC has acquired 123 hecta
of land from Querim Communica
The committee was appointed by
Centre to look into the details abo
possession of land by Thapar DuPo
Ltd. (TDL) for the project. TDL h
obtained provisional clearance from t
Goa Pollution Control Board in Febr
ary 1989 and Ms. Rita Heckrotte, env
ronmental engineer of DuPont clai
that the plant will use a "safe a
clean" method of production.

The plant, with 14,000 tonne nyl
capacity and 11,900 yarn capacity
expected to begin production in Oct
ber 1991. The project will create 10
direct and 3000 indirect jobs in the stat
Due to its tremendous employme
potential, the project is favoured
State Government officials.

# Chambal Fertilisers order for L & T

arsen and Toubro Ltd., has won a . 26-crore order for equipment sup- es to Chambal Fertilisers Ltd. against ff international competition. What is ore, some of the equipment ordered e being manufactured for the first time India. The company has also quoted r equipment worth another Rs. 11 ores to be supplied to Chambal under ternational competitive bidding. L and according to company sources, is pected to bag the contract in the next ouple of weeks.

Quite a few of the equipment for the hambal unit will be manufactured for e first time indigenously. These nclude the ammonia converter and the mmonia converter internal and the anufacture of these items itself is eing carried out in a unique manner to ave on huge transportation costs.

The eqiupment will be manufactured n three phases and final welding will e done at the site with the same precision as available in the company workshop. The equipment will in all weigh some 400 tonnes and transporting it all the way to the site could mean an expenditure of Rs. 3-4 crores. With the decision to piece together the equipment at site, there will be a lot of saving in transportation costs, sources say.

Chambal's order on L and T also includes RG, CG and synloop boilers and carbonate condensors collectively valued at Rs. 12 crores. All this equipment is meant for delivery during 1990-91. L and T is also expecting similar equipment orders from Tata Fertilisers for which international tendering has begun. Officials point out that these equipment supplies will be treated as deemed export and L and T will be entitled to CCS and other benefits. The company has won the Chambal order against stiff competition from some of the giant engineering companies in Italy and Japan. L and T engineers are particularly happy that even the Italian giant Snam Progetti has accepted L and T's unique manufacturing techniques in the case of ammonia converters.

L and T has recently also won a Rs. 6.75 crore defence order for manufacture and supply of three propeller shafting systems for the coast guard. In addition, the company is likely to win a contract worth Rs. 100 crores for equipment required by the nuclear power projects.

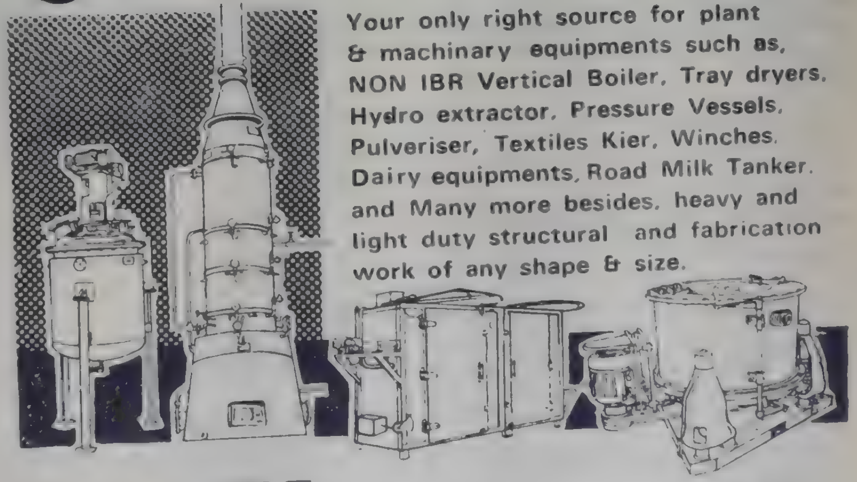
The company is also expected to get the prestigious Haldia order for building a naphtha cracker. But considering that Haldia petrochemicals complex is yet to decide on process technology it is too early to include this in the company's order book, the company officals said.

---

## FACT UNIT IMPROVES CAPACITY UTILISATION

The Cochin division of the Fertilisers and Chemicals Travancore limited (FACT), a Government of India enterprise, has effected significant improvement in the capacity utilisation of its 600 tonnes per day ammonia plant. This plant touched 100 per cent capacity utilisation on July 21 for the first time after commercial production of the plant started in October, 1974. The constraints in reaching higher capacity being thus overcome, the plant is expected to still better performance and improve profits.

The Cochin division of FACT also had a record production of the popular complex fertiliser factaphos during the month of July, 1990 with 47.775 tonnes agains the previous best of 45,050 tonnes in September, 1988. With a despatch of 80,341 tonnes in July, 1990, the unit had improved upon the previous best despatch of 76,149 tonnes in a month in Dec. 1989. At a time when the need for fertilisers is felt acute, the improved production and despatch of fertilisers from FACT is timely.



COME AND BE A SUCCESSFUL ENTERPREUNER WITH US.

Your only right source for plant & machinary equipments such as, NON IBR Vertical Boiler, Tray dryers, Hydro extractor, Pressure Vessels, Pulveriser, Textiles Kier, Winches, Dairy equipments, Road Milk Tanker. and Many more besides, heavy and light duty structural and fabrication work of any shape & size.

DO DROP A LINE OR CALL US.

anu DESIGNERS & FABRICATORS

C-1/12, G.I.D.C. ESTATE, OPP.: AMBICA NAGAR SOCIETY,
ODHAV, AHMEDABAD-382 415. PHONE: O. 871188

LET OUR EQUIPMENTS PLAY A SMALL ROLL IN YOUR GREAT SUCCESS.

# Fert. units profitability declines

Produce and be perished is what could explain the situation. The declining profitability of the fertiliser industry in India in recent years has been extensively reported. Figures speak for themselves. According to the annual report of the Department of Fertilisers for 1989-90, the profitability of the public and co-operative sector in Rs. crores declined from 38.9 in 1987-88 to 145.11 in 1988-89 and 286.08 in 1989-90.

The Government has set a target of 235-240 million tonnes of foodgrains production by 2000 AD. A further addition of at least 9 million tonnes nutrients is needed on top of about 11.5 million tonnes nutrients consumption already achieved. In other words, we need about one million tonnes incremental fertilisers use per annum in the nineties.

For the material to come from the indigenous industry, new investment in setting up fertiliser projects must be ensured and existing units must be able to generate profits and have incentives to plough back surpluses. For import of fertiliser, one must keep in mind the question of availability in the world market and the problem of foreign exchange scarcity.

Votaries of fertilisers imports particularly nitrogenous material where domestic production is possible with local resources, have always ignored certain basic aspects. First, imports are not that cheap as they would appear on the face of it. World market prices for fertilisers are set in response to global demand-supply forces and are unrelated to the cost of production in the exporting countries. And, India and China being two major buyers in the world market, their purchasing decisions determine whether imports will cost low or high.

Also, the so called ''cheap imports'' particularly towards the end of 1986, were the result of increased self-sufficiency by India and China. Because of the glut within the country, India did not buy any significant quantities of urea during the last three years. And yet, the world market prices showed an increasing tendency during 1987 and 1988 primarily because China was very much in the market. During 1989, however, there was no significant firming up as China curtailed its purchases in view of internal disturbances.

The second question relates to the future global demand-supply balances. In this connection, projections of the World Bank/FAO/UNIDO working group on fertilisers released recently (May 1990), point towards a tight situation in nitrogen and dwindling surplus of phosphate and potash in 1994-95.

Apart from posing problems of availability, this would also mean increasing trend in the urea prices. At the moment, there is no evidence of investment in new ammonia-urea capacity world-wide which could, perhaps be initiated only after the world market prices have built up to sufficient remunerative levels. The impact of such investments on availability would, however, be felt towards the latter half of the nineties.

Third, when we compare our cost of production with the cost in the fertiliser exporting countries, it is not on a like-to-like basis. For example, the cost of urea from an old depreciated plant abroad is bound to be significantly lower than the production cost from a newly commissioned unit in India which entails much higher investment cost due to overall inflation, currency depreciation and impact of taxes and duties etc.

Coupled with this is the price of natural gas, the dominant feedstock the world over. That being charged in the exporting countries is comparable to what the fertiliser plants in India a required to pay. It bears little repetitio that natural gas costs from 1/10 to 1/ in Gulf countries and the US, respectively, as compared to the price charge in India.

And, if the recently reported recommendations of the Kelkar Committe amongst others, to further increase th gas price, were accepted by the Government, then this would mean a furthe widening of the gap. Import of fertilisers has, unfortunately, been projected a an easy option particularly in the context of the current debate on utilisatio of natural gas. ''Power cannot b imported while fertiliser can be''. Th argument is often used to indicate preference for the former over the latter an the US also getting reflected in the contemplated gas use policy.

First, is the debate at all relevan when we are flaring one-third of the ga production in the country? We should aim, through coordinated planning timely implementation of all on-going projects, be it fertiliser or power to avoid flaring.

Second, when we talk of imports, whether power or fertilisers, we do not have adequate foreign exchange to pay for them. And, why do we need to spend foreign exchange on importing nitrogenous fertilisers which can be produced domestically from our own reserves of gas which we have in abundance. Third, we must not forget that gas is a valuable source of energy and its use should be prioritised for areas which cannot utilise alternative feedstocks successfully.

The gas utilisation policy evolved in the early 80s, its use as feedstock and fuel in fertiliser production, was accorded the highest priorty. This was also keeping in view the fact that alternative fuels such as coal, could be successfully used in power generation while use in fertiliser could pose insurmountable problems.

# Fertiliser demand in WB yet to pick up

The demand for fertilisers in West Bengal in the current kharif season has so far not picked up as much as expected due to a delay in transplantation by heavy rainfall. Until the middle of this month, the rainfall in south Bengal districts was substantially more, in some areas as much as 57 per cent in excess of that in the corresponding period of last year. Such excessive rainfall, it is felt, is not going to help the crop.

The north Bengal districts present a different picture. Compared to last year, the rainfall so far in these districts has been scanty. Some rainfall, reported a few days go from Malda and other places, is considered inadequate to start transplanation in full swing. "We are yet to feel the impact of the season which has already started" observed a spokesman of a leading fertiliser company. The beginning of the season normally heralds brisk demand for fertilisers. That has yet to occur. A week's dry spell, will be enough the push the demand, it is felt.

If the current supply position is any indication, there should be no cause for worry even if the fertiliser demand picks up well, according to fertiliser industry sources. The stock of urea in different field-level godowns in the state is estimated at more than one lakh tonnes. Besides, the supplies from producing units have been satisfactory.

The Durgapur unit of Hindustan Fertiliser Corporation, though producing intermittently, is expected to fulfil its supply commitments for the current kharif. The unit is to supply about 55,000 tonnes to West Bengal and another 30,000 tonnes to Orissa. "We have already supplied more than 10,000 tonnes to Orissa and are taking care of the West Bengal market squarely", says a spokesman for HFC. Despite production problems in the third unit, despatches from HEC's Namrup factory have not been altogether bad. Out of targeted 72,000/73,000 tonnes, about 22,000/23,000 tonnes have already been despatched from Namrup.

The performance of the Fertiliser Corporation of India and not been very good, largely because of production problems at Talcher and Sindri units. For example, supplies from FCL, according to state agriculture department sources, have been a meagre 4,000 tonnes so far against the promised 11,000 tonnes. However, the shortfall in supplies from FCI has been more than compensated by improved supplies from IFFCO and Kribhco. IFFCO, the sources point out, has so far supplied more than 25,000 tonnes, though some shortage of a given variety, has been reported from certain pockets.

The shortage, industry sources point out, is not much. Also farmers, are not too bothered. The demand for fertiliser being highly seasonal, if one variety is not available, the farmers will switch over to the next variety that is available. The supply of DAP (di-ammonium phosphate) from Hindustan Lever's Haldia plant has been steady. By following an aggressive marketing strategy, the company has already supplied the bulk of its commitment due to be fulfilled by September.

## DU PONT SNAPS TIES WITH INDIAN AGENT

Du Pont Inc. of the US, has severed its four-decade old links with Union Commercial and Industrial Co. (UCI) the Indian agents, and appointed new distributors. Du Pont has snapped ties with UCI headed by Mr. Lalit Mohan Jamnadas. Bhimrajka Impex Pvt. Ltd. will be the new distributors for the complete range of Du Pont industrial polymer products. The change in the agency will in no way affect the distribution of Du Pont products in India and the entire range of advanced polymers for industrial application and speciality wire and cable products would continue to be available.

AVAILABLE

CONC: NITRIC ACID (98.5%)
DILUTE NITRIC ACID 60%
FORMIC ACID (85%)

Manufactured by:

GUJARAT NARMADA FERTILIZER CO. LTD.

CONTACT FOR YOUR REQUIREMENTS:

**CHEMOX CHEMICAL INDUSTRIES LTD.**
Pooran Asha Building, 317, Narsi Natha Street, Bombay-400 009.
Phone: 335061 (10 LINES) Gram: INCHEMOX
Telex: 11-76723 CHMX IN Fax: 91-22-855 89 38

### TUTICOIN ALKALI CHEMICALS

## SPIC may buy TIDCO holding

The SPIC board will consider a proposal to buy the shares of Tamil Nadu Industrial Development Corporation (TIDCO) held in Tuticorin Alkali Chemicals and Fertilisers Ltd. (TAC).

The Tamil Nadu chief secretary and chairman of SPIC, Mr. M.M. Rajendran, told newsmen in Madras on Aug. 1st, that as against the normal equity stake of 26 per cent in joint sector companies, TIDCO had a 46 per cent stake in TAC and five per cent in SPIC.

An earlier SPIC proposal to buy the excess holding of TIDCO had not materialised. Now, the government was examining as to what extent it could buy the shares. The proposal would be considered by SPIC's board against the backdrop of funds available for investment in new projects and other programmes, he explained.

Mr. Rajendran said the state government had already taken a policy decision to allow disinvestment of TIDCO's holding in joint sector units wherever necessary. But the decision would not apply to flagship and growth-oriented companies. Referring to the subsidy loss to TAC in view of the revised retention price formula announced by the Centre for ammonium chloride, the chief secretary said the state government had already taken up the issue with the Union fertiliser ministry and was hopeful of a favourable response.

Asked about SPIC's joint venture in Jordan for manufacturing phosphoric acid, he said it had to still raise offshore loans for funding the $100 million project. It would be implemented after finalising the process technology.

The buy-back arrangement for the chemical would take effect after the production starts. The entire production of 2.08 lakh tonnes could be absorbed by SPIC.

Of the total share capital of $25 million, SPIC's equity would be 60 per cent. MMTC's participation in the project would be decided by the commerce ministry.

SPIC would export the entire plant and machiney by way of capitalisation of technical consultancy. Its SMO division would be actively involved in the project; the joint venture could also lead to the development of a stream of sulphuric acid plants. Mr. Rajendran noted that SPIC was keen on the early implementation of the project as it would expand its manufacturing activity. On the question of restricting the tradin business, he said it mainly depended o the Centre's policy to import fertilisers.

He disclosed that the company boar had also cleared the modernisation o fertiliser plants estimated to cost abou Rs. 100 crores. Asked about the proposal to restructure the boards of othe companies, promoted by SPIC, he sai it would not be taken up in the lates board meeting. The chief secretary sai that Tamil Nadu had a strong case fo getting surplus gas from Bombay Hig through a regional grid.

---

### RCF AMMONIA PLANT MODERNISED

The 25 year old ammonia plant at th Trombay complex of Rashtriya Chemicals & Fertilisers Ltd., has been modernised by changing over the process fro partial oxidation to steam reforming a a cost of Rs. 65 crores. Mr. R. Chandrasekaran, acting Chairman & Managing Director, RCF, inaugurated th modernised plant on Aug 2nd.

The old ammonia-I was working a reduced capacity of 285 tonnes per day against the rated capacity of 350 TPD with an energy consumption of 16 MKcal/te of ammonia on account of th ageing of the equipment and obsolete technology of partial oxidation.

AVAILABLE EX-STOCK

Para Hydroxy Phenyl Acetamide
Atenolol
Mebendazole
Chlorpheniramine Maleate
Frusemide
Ortho Nitro Benzaldehyde
Nifedipine
Diclofenac Sodium
2-Chloro 5-Nitro Aniline

Please Contact Manufacturer:

M/s. RADIANT PHARMACEUTICALS PVT. LTD.

F-14, Sector 7 Market, Vashi, New Bombay 400 703.
Tel.: 0215-662019

**PESTICIDES REGISTRATION**

# Amendment to Insecticides Act to be dropped

The government has decided to drop the proposed amendment to Section 9(3) of the Central Insecticides Act 1968 relating to regular registration of pesticides, it is learnt.

The amendment proposed by the Union agriculture ministry was to provide a five-year protection to the manufacturer who registers the product under Section 9(3), thus virtually removing Section 9(4) stipulating repeat registration.

At present a pesticides manufacturer has to register the new product under Section 9(3) and the repeat registration under Section 9(4) was available easily to the subsequent applicants.

The dropping of the proposal is a resultant of the strong resentment from small scale pesticide formulators. They allege that the proposed amendment would amount to a backdoor entry of the Patent Act and it would be beneficial to multinationals providing them a monopoly for atleast five years. They had also pointed out that it would facilitate the first applicant to charge exorbitant price from the farmers.

The government has further decided to give adequate representations to various associations of manufacturers on the official committee so that their views could be considered while taking policy decisions. The authorities would also speed up registration of exports to give a boost to the sector.

## PUNE SEMINAR ON HERBAL PESTICIDE

An Indian herbal pesticide "Indiara", has drawn the attention of agro-scientists worldwide and its "broad-spectrum fungicidal properties" will be discussed at a seminar to be attended by an expert group at Pune in August.

Prof. J.F. Moore, Junior Director of Research and Professor of Plant Pathology in the South-west Missouri State University, is visiting India specially to read a paper on the trials on this non-toxic pesticide conducted in research laboratories.

Prof. Moore's interest was aroused in the midst of his research-experimentation on the application of "Indiara" a product of 14 years' research by a Pune-based chemist, Mr. M.N. Sukhatme, on grapes, vegetables, crops and ornamental plants.

In his communication to Mr. Sukhatme, Prof. Moore said "our research indicates that "Indiara" controlled three major fungal diseases, occuring on grapes, when applied as a protective fungicide. The research also indicates that "Indiara" might kill or suppress the pathogen in the host plant after infection. A specific study would have to be done to conform or reject this hypothesis."

Prof. Moore said "Indiara" compared favourably with "Bayleton", a new sterol inhibitor (SI) fungicide. This was important because any new fungicide must be able to compete with compounds already available in the market. "Indiara' is derived from natural substances, making it more acceptable since there was concern about the effects of pesticides on human health and the environment.

The herbicide had "contained effectively" three major grape diseases —downy mildew, powdery midew and black rot. Cluster weight of grapes, where "Indiara" was sprayed, had increased "appreciably", according to Prof. Moore.

"Indiara" has been hailed by scientists of international repute like Dr. Alexander Tabey, a former technical director of the Environment Protection Agency, USA.

FOR YOUR REGULAR REQUIREMENTS OF

**BETA NAPHTHOL**

*Manufactured by*

**M/s. Eastern Naphtha-Chem Ltd.**

Contact:

**M/s. SPAN INTERMEDIATES**

6th Floor, Mustafa Building, Sir P.M. Road, Bombay 400 001.

Telex: 011-86836 SPAN IN

Tel: 314099

### KANDLA-BHATINDA CONTROVERSY ENDS

# Pipeline, railway line projects cleared

The Union government has resolved the long-drawn controversy over the Kandla-Bhatinda pipeline project. In an unexpected and dramatic move, the government has decided that both the pipeline and the railway line would be allowed to be constructed on the Kandla-Bhatinda sector.

A decision to this effect was taken at a high-level inter-ministerial meeting at New Delhi recently. The meeting was convened by the finance minister, Mr. Madhu Dandavate, and attended by the railways minister, Mr. George Fernandes and petroleum and chemicals minister, Mr. M.S. Gurupadaswamy.

Mr. Fernandes is understood to have agreed to the clearance of the Kandla-Bhatinda pipeline project since the railway line on this sector is also to be cleared. The railway ministry had put up a stiff opposition to the products pipeline project on the ground that a railway line was more viable and was more beneficial to the economy of the area it would be serving.

The Kandla-Bhatinda pipeline project would now be referred to the Union Cabinet for its final approval. Similarly, the railways will have to finalise the proposal for the railway line. A large portion of Kandla-Bhatinda sector has metre-gauge railway tracks, which have to be converted into broad-gauge line and a small distance between Virangam and Bhildi in Rajasthan has to be provided new broad-gauge connection. All these details will have to be finalised so that the government could provide quick clearance to the railway line project.

The inter-ministerial meeting was convened by the finance minister at the instance of the cabinet. Early last month the Union Cabinet had referred the proposal for setting up the Kandla-Bhatinda petroleum products pipeline project back to the finance ministry.

The Cabinet came to this conclusion after examining the proposal. It had also taken note of the persisting differences among ministers over the need for the pipeline project and therefore directed that the finance ministry should soon call a meeting of ministries differing over the project to arrive at a decision.

Contrary to expectation, the Cabinet meeting did not revive the inter-ministerial war over setting up this key project. The finance ministry was able to resolve the controversy for good in only one meeting. The controversy had earlier appeared to have ended after the finance ministry cleared the project in April last and sent it to the Cabinet.

The Kandla-Bhatinda pipeline project is one of the most delayed projects in recent times. It has been delayed by over two years and the cost of 1,330-kilometre pipeline project has shot up from an original estimate of Rs. 650 crores to Rs. 917 crores.

In addition, the Indian Oil Corporation (IOC), which will implement the project, has already coughed up $32,000 per month as commitment charges for its failure to utilise the loan it had negotiated with the World Bank. The total amount of the negotiated loan is $350 million. Of this, only $178 million is for the Kandla-Bhatinda pipeline project and the rest is for other projects to be implemented by IOC.

The delay had in fact upset all project cost calculations as even the foreign exchange component of the project cost had now escalated from Rs. 155 crores originally to Rs. 205 crores now.

The ministries, which quarrelled over the project, were the petroleum and chemicals ministry, the railway ministry and the defence ministry, which joined the battle recently. The Planning Commission also had played a significant role in contributing to the inter-ministerial battle.

While the petroleum and chemicals ministry wanted the pipeline project to be set up by IOC, a public sector unit under its administrative charge, the railways ministry felt that the government should not allow the project, since this would erode the viability of a railway line project planned on the same Kandla-Bhatinda sector.

The defence ministry, which joined the fray a little later, had argued in favour of a railway line on strategic considerations and put pressure on the government to complete the railway project expeditiously so that a viable multipurpose transportation network could be established on this sensitive sector, much of which runs parallel to the Indo-Pakistan border.

There were, however, no such sign of differences of perception over the project, when it was mooted by IOC. A detailed economic analysis was carried out by the projects appraisal division of the Planning Commission.

The analysis showed that the capital cost of the pipeline would be Rs 610 crores, while that of the railway system on the same sector would be Rs. 948 crores. In the light of this analysis, the Public Investment Board (PIB), an inter-ministerial body, recommended the project at a meeting in January 1989.

Two months later, IOC negotiated the loan with the World Bank and signed the agreement on September 11, 1989, as part of its advance action for timely execution of the pipeline project.

But the finance ministry could not clear the project and send it to the Cabinet as the then railways minister, Mr. Madhavrao Scindia, opposed the project on the ground that a railway line already being constructed on that route could adequately meet the requirement of carrying petroleum products.

The then planning minister, Mr. ladhavsinh Solanki, also opposed the roject and even sought the intervention f the then Prime Minister. Meanwhile, he Planning Commission gave clear-nce to a Kandla-Bhatinda railway line roject, which was actually meant to re-empt the final clearance for the ipeline project.

Hectic lobbying followed. The etroleum ministry argued that while the lelay had threatened to disrupt plans to neet the large demand for petroleum lemands in the north-west region, the conomic cost of transportation by rail was 2.5 times that by the proposed pipeline.

After the National Front formed its government, the controversy continued till the then Planning Commission deputy chairman, Mr. R.K. Hegde put an end to the debate and recommended its presentation before the Cabinet, since the PIB had already cleared it. Subsequently, the finance ministry sent the project to the Cabinet in April 1990, raising hopes of an early clearance for the already delayed project.

But the Cabinet returned the project to the finance ministry, which conveyed the inter-ministerial meeting to pave the way for the final clearance for the IOC project.

## CUSTOMS DUTY CONCESSIONS

The existing import duty concession in respect of membrances for replacement available to caustic soda plants has been extended to all other industrial plants.

Basic customs duty of 25 per cent with nil additional duty has been prescribed for cotton yarn, cotton terry towelling fabrics and cotton terry towels. Cotton yarns and cotton terry towels have also been exempted from the auxiliary duty, an official release said in New Delhi on Aug 7th.

In the case of cellulose acetate flakes basic customs duty has been reduced from 100 per cent to 55 per cent ad valorem.

## KAMA URGES MIDC TO REVIEW WATER RATE

The Kalyan Ambernath Manufacturers Association (KAMA) has demanded reconsideration of the proposed water rate increase of the Maharashtra Industrial Development Corporation to such industries who have not obtained the N.O.C. for building completion certificate from the Kalyan Corporation or from the MIDC. The Kalyan Ambernath Manufacturers Association has said that there are about 50 such industries in Kalyan-Dombivli-Ambernath area who have not obtained the NOC and carrying on the business for the last many years and the MIDC has supplied them the water.

C.D. CORPORATION IS PROUD TO OFFER
SPECIALITY AUXILIARIES FOR FINISHING

ULTRA DISPERSE NNO PRODUCT CD : Efficient Dispersing Agent for Vat and disperse dyes.
ULTRA-FIX TRP : Excellent Solvent/Emulsifier System for Phthalogen Blue-Dyeing.
ULTRA FIX M/M CONC. : Effective Dye Fixing Agent for Direct and Reactive Dyes.
DYEING BINDER CD : Ideally suited for pigment dyeing.
ULTRA CAR TCI : Carrier for Polyester Dyeing.
FINO D FOAM JH : Effective Antifoaming Agent for Jet Dyeing.
CIDALEVELLER SP : Excellent Levelling-cum-Dispersing Agent for Disperse Dyeing in Beam/Jet Dyeing Machines.
POLYLEVELLER JD : Dispersing-cum-Levelling Agent for Disperse Dyes.

For further details contact manufacturers
C.D. CORPORATION
Kamani Chambers, 32, Gr. Floor, R.K. Marg, Ballard Estate, Bombay 400 038.
Tel.: 2617801-2, 2612817, 2619994 Gram: "UDAY" Bombay 400 038. Tlx.: 11 76581 JHPL IN
ADVT. NO. 9002

# Gurupadaswamy favours more stringent curbs on oil use

The recent price hike by OPEC and the Iraqi invasion of Kuwait were bound to have their impact on India's oil import bill, petroleum and chemicals minister Mr. M.S. Gurupadaswamy said in New Delhi on Aug 6.

In an interview, Mr. Gurupadaswamy said the increase from $18 a barrel to $21 announced by the OPEC would hit our foreign exchange position. The Iraqi invasion of Kuwait had disrupted the oil supply, adding to the pressure on the country's economy. Crude supply from the Soviet Union has become uncertain as the Soviets are keen on getting hard currency for oil in view of their difficult foreign-exchange position.

He said international oil experts were apprehending a hike in the crude oil price ranging from the present price level to even $30 a barrel. Although the petroleum and other concerned ministries were assessing the situation, it would take time to ascertain the quantum of the burden the country would have to face due to these factors.

The petroleum minister said keeping in view the limitations of foreign exchange reserves, there was no alternative but to be austere in the use of petroleum products to keep the import bill under control to the maximum possible extent.

Mr. Gurupadaswamy said the austerity measures announced by the government were not sufficient. There was a need for creating awareness among the people for conserving petroleum products and checking their misuse. "Every drop of petrol we save will help the country," he added.

The country had imported petroleum products worth Rs. 6440 crores in 1989-90 and the finance ministry had asked the government to maintain the same level of imports during the current financial year.

Mr. Gurupadaswamy said that keeping in view the rapid increase in the consumption of petroleum products during the past two years, increase in the prices of crude oil by OPEC and disruption of oil supply from Kuwait had resulted in further hike in the prices of petroleum products in the international market.

The petroleum ministry had no alternative but to ask for an increased allocation for oil imports and call upon the people to strictly maintain austerity measures to keep the consumption within limits.

He said the petroleum ministry had asked for higher allocation from the finance ministry and negotiations were on.

Mr Gurupadaswamy said in addition to the increase in the price, the demand-growth ratio had gone up in 1989-90 over 1988-89 by eight per cent. The trend was likely to continue during the current financial year.

He said the import of crude oil and petroleum products was worth Rs. 6440 crores during the last financial year and the finance ministry had allowed the same amount for the current financial year.

The rupee value of dollar was decreasing and the demand and supply gap was increasing. The country had to import 18 million tonnes of crude oil during the last financial year and the country had to import 30 per cent of the total requirements, he said.

The minister said "the options are limited. Either restrict the consumption or increase the foreign exchange for importing crude oil and other petroleum products". "If we have to stick to ou target of foreign exchange limitation austerity in the consumption of petro and other allied products would have t be maintained," he said.

Mr. Gurupadaswamy said that t meet the growing requirements, ther was a "need to adopt short-term, mid term and long-term plans of action"

Referring to short-term planning, h said a package of austerity measure was announced in June this year, "wit reluctance as there was no option lef keeping in view the foreign exchang reserve".

The minister said that restriction were imposed not only on people. Th government and different public secto undertakings were also brought unde the purview.

He said some ministries had oppose the restrictions but the petroleum ministry was pressing for the implementatio of austerity measures to maintain "uniformity". He, however, made it clea that "if the required foreign exchang is made available, we will not hesitat to lift the restictions."

The minister said it would take four months to assess the impact of the austerity measures. He said as part of midterm planning, fuel efficient vehicles would have to be developed, public transportation system made more efficient and comfortable, alternative sources of energy devised and transport, industry, agriculture, household and domestic sector restrict its use. Measures for fuel efficiency, replacement of old boilers and standardisation of agricultural equipments were other steps suggested in this connection.

For long-term planning, large investments had to be made for curtailing imports of petroleum products and for increasing indigenous production of petrol. He said the country was not self-sufficient in the oil sector. To meet this shortfall, there was a need to increase oil production in the country.

Mr. Gurupadaswamy said a conservation cell, headed by a joint secretary of the petroleum ministry, had been created for long-term planning.

Similarly, an inter-ministerial working group under the chairmanship of the petroleum ministry secretary had been formed to formulate an action plan for import of crude oil.

He said the government wanted to increase production to cope with the demand of petrol and petroleum products which was 52.8 million tonnes in 1989-90. It would go up to 77.7 million tonnes by the end of the Eighth Plan and to 200 million tonnes by the year 2000.

Of the 18.4 million tonnes of import requirements in 1986-87, it had gone up to 26.3 million tonnes in 1988-89. Of this, he said, the Soviet Union was supplying 4.5 million tonnes of crude oil and about three million tonnes of other petroleum products under rupee-trade agreement per year. The Soviet Union was also under foreign exchange constraints and as such was trying to persuade the country to make up the gap from other sources.

He said the demand for motor spirit had gone up from 8.52 per cent to 14 per cent and diesel consumption from six per cent to eleven per cent during the last five years.

## KOTHARI IND. GOING IN FOR MODERNISATION

Kothari Industrial Corporation Limited is going in for modernisation programmes costing about Rs. 13.86 crores over the next two to four years. Of this Rs. 10.83 crores is soft loans from financial institutions and banks, and Rs. 3.03 crores is being contributed from the company's internal accruals.

Outlining the details of the modernisation progamme, one of the top executives of the company said that in the textile division, the programme is being taken up in two phases. The first phase which started in December 1989 is expected to be completed by March 1991, and will cost Rs. 3.25 crores.

This will deal with the two mills in Coimbatore and also included small additions to the mill in Adoni, Andhra Pradesh. The second phase, which is expected to be over by March 1992 will cost Rs. 5.60 crores.

In the company's fertiliser division, modernisation will be undertaken at the cost of Rs. 1.9 crore. Of this Rs. 1.42 crore will be financed by the 'ICICI', and the remaining Rs. 0.48 crore will be the company's own contribution. The works planned are in the superphosphate plant at Ennore, Madras and are expected to be completed by June 1991.

CENTRAL SALT & MARINE RESEARCH INSTITUTE

Gijubhai Badheka Marg, Bhavnagar 364 002. **Telex: 0182-230 SALT-IN Telephones: 24494, 26110 Gram: 'NAMAK'** Bhavnagar

**Institute offers know-how for the following processes through NRDC (Group-A) and directly from Institute (Group-B)**

Group-A
* HIGH STRENGTH PLASTER OF PARIS
* BROMINE FROM SEA BITTERN
* LIGHT BASIC MAGNESIUM CARBONATE
* MAGNESIUM HYDROXIDE
* SYNTHETIC CALCIUM SILICATE
* POTASSIUM NITRATE BY CHEMICAL ROUTE
* SODIUM ALGINATE
* KAPPA CARRAGEENAN
* INTERPOLYMER MEMBRANES
* ELECTRODIALYSIS

Group-B
* REVERSE OSMOSIS
* ALUMINIUM HYDROXIDE GEL POWDER
* ALUMINIUM SILICATE (ALUSIL GRADE)
* JOJOBA BODY CREAM
* LOW DENSITY PRECIPITATED SILICA
* SOLAR STILLS
* IODISED SALT

Contact Addresses:
**The Managing Director, National Research Development Corporation,**
20-22, Zamroodpur Community Centre, Kailash Colony Extension, New Delhi 110 048.
**The Director, Central Salt & Marine Research Instt.**
Gijubhai Badehka Marg, Bhavnagar 364 002.

**The Institute undertakes consultancy, sponsored and collaborative assignments and provides technical assistance in the following areas:**

1. Solar salt works — Survey, design, layout and modifications.
2. Preparation of different grades of salt (Dairy, AR grade, iodised), Sels' mixt and mixed salt.
3. Recovery of marine chemicals from mixed salt and bittern.
4. Desalination of saline water and effluent treatment.
5. Survey and cultivation of seaweeds and recovery of chemicals from seaweeds.
6. Non-conventional oil yielding plants for waste land development.
7. Preparation of inorganic chemicals — mainly silicates.
8. Solar energy utilisation.

# Petrol, oil import bill to touch Rs. 8000 cr.

Total import bill on crude oil and petroleum products could rise to around Rs. 8000 crores in the current year against Rs. 6400 crores in 1989-90, thanks to the rise in world crude prices to $21 per barrel (6.4 barrels make a tonne).

Usually India imports 80 per cent of its needs on a contract basis with 20 per cent being on spot. Some of the imports under the former do take the current world oil prices into account forcing the country to spend more foreign exchange.

According to the Centre for Monitoring Indian Economy (CMIE), Government has made a provisional estimate to import 18.60 million tonnes in 1990-91 against 19.60 million tonnes in 1989-90 of crude oil with net imports of petroleum products estimated to go upto seven million tonnes in 1990-91 against 5.35 million tonnes in 1989-90.

CMIE has estimated gross value of imports of crude oil and petroleum products as percentage of total exports at 23.12 per cent in 1989-90 against 21.58 per cent in 1988-89.

Clearly, the Government will have to cut domestic consumption of oil which can be done if domestic and private transport is totally discouraged, if not banned.

The discovery of Bombay High in the mid-Seventies significantly changed the energy outlook for India. India being a major oil importer, was bound to be affected by the oil stocks of the 70s. Crude oil imports (in value terms) as percentage of total exports increased from nine per cent in 1970-71 to 33 per cent in 1974-75.

In 1979-80, this share increased at 51 per cent in 1980-81 to 79 per cent. The discovery of oil in Bombay High in 1975-76 was perceived to be a major boon to the Indian economy. Crude oil production rose sharply in the Eighties. The initial increases in production were modest and in 1980-81 the agitation led by the All Assam Students Union caused a sharp decline in crude oil production. With the withdrawal of the agitation and the main thrust of Bombay High production setting in production picked up in the early Eighties.

Crude oil production increased from 10.5 million tonnes in 1980-81 to 21.1 million tonnes in 1982-83 and 30.2 million tonnes in 1985-86. Most of the boom was led by Bombay High where production increased from five million tonnes in 1980-81 to 12.9 million tonnes in 1982-83 and 20.8 million in 1985-86. And that is where the boom stopped.

With no new discoveries to match the fast depletion of Bombay High reserves, the Government took a decision to peg crude oil production of Bombay High at around 29 million tonnes per annum, the strategy being that the balance recoverable reserves of Bombay High would enable the country to produce crude oil till the end of the century.

The discovery of fresh reserves in category I basin seems to have corrected some of this pessimistic view or atleast helped overcome the fears of over-exploiting the Bombay High reserves.

As a result, the plateauing of crude oil production at about 30 million tonnes per annum was finally reached in 1988-89. By 1989-90, production reached 34.08 million tonnes and was further expected to increase to about 35 million tonnes in 1990-91.

Production from the Bombay High basin, which had registered declines in 1986-87 and 1987-88, recorded increases of 4.7 per cent in 1988-89 and then by 2.8 per cent in 1989-90. Total crude oil production increased by 5.6 per cent in 1988-89 and 6.4 per cent in 1989-90.

The impressive increase in crude oil production in the Eighties was
matched with a corresponding decre
in crude oil imports.

The total domestic availability
crude oil increased subsequent to
boom from Bombay High. But even
its production reached a plateau
1985-86, imports increased.

Thus, Bombay High succeeded m
in meeting the increased consumpti
needs of crude oil than in reducing
dependence on imported oil.

International crude oil prices peak
in 1980 to $35 a barrel (spot prices
light arabian oil). Consequently, Indi
oil import bill shot up from Rs. 21
crores in 1979-80 to Rs. 3,349 crores
1980-81. The unit import pri
increased from Rs. 1357 per tonne
Rs. 2,061 per tonne.

Import quantity declined from mo
than 16 million tonnes in 1979-80 a
1980-81 to an average of less than 15
million tonnes in the first half of t
eighties.

In 1986, international crude pri
crashed to less than $13 a barrel co
pared to $27.53 a barrel in 1985. T
import bill declined by more than 42 p
cent from Rs. 3,687 crores in 1985-
to Rs. 2,120 crores in response to th
more than halving of prices.

However, the quantity of imports h
since increased to reach 19.35 milli
tonnes in 1989-90. Crude oil prices ha
started moving upwards again. T
average price was $13.2 a barrel
1988. This increased to $15.7 a barr
in 1989 and was projected to increa
to $17 a barrel in 1990.

The crude oil import bill has current
touched around Rs. 4000 crores. Give
the foreign exchange crunch and th
general balance of payments problem
it is imperative that increase in co
sumption of petroleum products is co
tained.

# Petroleum ministry seeks urgent release of forex

Government has received an SOS from the petroleum ministry for release of more foreign exchange following a sudden spurt in oil prices in the international market, official sources said.

A detailed note supporting the demand for more foreign exchange release has been submitted by the petroleum ministry to the finance ministry and the matter has gone to the Cabinet Committee on Economic Affairs for a decision, the sources said.

The Opec decision to raise the benchmark price of crude to $21 a barrel from the ruling $18 a barrel has suddently led to a spurt in prices of crude in the market has already touched $23 a barrel in some markets.

According to an estimate, India's oil import bill may be pushed up by another Rs. 1,200 crores to over Rs. 9,200 crores from the estimate of Rs. 8,000 crores for the current year, the sources said.

The finance ministry is understood to have asked the petroleum ministry to peg the value of imports at less than Rs. 7,000 crores for the current year as part of an austerity drive which includes curbs in consumption of petroleum products.

The sources said India's requirement of crude for the current year has been put at over 15 million tonnes and petroleum products at over five million tonnes, but unrestricted demand for petroleum products is actually put at over 12 million tonnes.

This may force India to buy products in the spot market but with the prices so high, the foreign exchange restrictions puts a tremendous burden on the ministry. It leaves no option but to ask for more foreign exchange. The petroleum ministry is concerned about how to raise resources to meet the increased costs of imports.

---

## INDO-SOVIET MEET ON OIL INDUSTRY BEGINS

The eighth meeting of the Indo-Soviet working group on co-operation in the field of oil industry opened in New Delhi on August 6th.

The Soviet delegation was led by Mr. Mukhamedzyanov, deputy minister in oil and gas industry, USSR, and the Indian side by Dr. Madhav Godbole, petroleum secretary.

Both sides commended the work on the co-operation programme for exploration of hydrocarbons under the intensive integrated exploration projects for the north Cambay, Cauvery and West Bengal basins. They also expressed the hope that long-term co-operation in the oil sector will be further strengthened.

---

## PETRO COMPLEX IN PUNJAB MOOTED

The PHD Chamber of Commerce and Industry (PHDCCI) has suggested the setting up of a petrochemical complex in Punjab with a view to injecting large-scale investment in the State, particularly in the public sector.

This would help in providing raw materials to many high tech units and will accelerate the pace of establishment of large number of downstream industries in the field of plastics, polymers packaging and agri-plastics. The chamber, in a memorandum has also suggested the creation of nodal agency for agricultural products with the Department of Industries to provide single-window service to those interested in going into production aond marketing of such products.

For Your Requirement of
The Most Powerful Bleaching Agent:

**SODIUM CHLORITE**

50%, 80% Flakes/ 23% Liquid
Used For Bleaching of:
Paper Pulp, Cellulose, Textiles, Synthetic Yarn,
Oils, Waxes, Guar Gum etc.
Manufactured by:

**Zed Chem Pvt. Ltd.**

**Office:**
Jaydip, 67 Chaitanyanagar,
Near Sardar Patel Stadium,
Ahmedabad 380 014.
**Tel.: 401423**

**Bombay Office:**
**Eastern Industries**
Kasturchand Mill Estate,
Dadar (West) Bombay 400 028.
**Tel.: 4221568/4304485**

# TN puts up case for gas pipeline for South

Tamil Nadu has a good case for seeking a pipeline southward to bring to the state the surplus natural gas from Bombay High region, according to the state chief secretary, Mr. M.M. Rajendran.

Mr. Rajendran told newsmen at Madras on Aug 2, that total surplus availability of gas from the western offshore fields was about 61 million cubic metres per day, while the carrying capacity of the HBJ (Hazira-Bijaipur-Jagdeeshpur) pipeline was only about 39 million cubic metres of gas per day.

Though one way of utilising the about 20 million cubic metres of surplus gas was to lay a parallel pipeline to the HBJ line, the natural thing would be to see that the surplus gas went to areas which faced a shortage of natural fuels, he said. Tamil Nadu has no coal reserves and to bring coal from distant centres for the state's power generation is uneconomical by any standard, which strengthens the state's case for a gas pipeline, he said. Mr. Rajendran said the main point the state government had been emphasising was that there was no difference in cost between laying a pipline parallel to the HBJ line and in having a pipeline to a new area.

Mr. Rajendran, also chairman of Southern Petrochemical Industries Corporation (SPIC), a joint sector undertaking with Tamil Nadu Industrial Development Corporation's (Tidco) participation, said SPIC's new joint venture at Jordan for manufacture of phosphoric acid would be taken up after the process technology for it was finalised.

He said the project's capacity of 2.08 lakh tonnes per annum could be entirely consumed by SPIC. A stream of matching sulphuric plants was also part of the project, totally estimated to cost $100 million. Mr. Rajendran said of the cost, the equity portion would be $25 millio of which 60 per cent would be India equity contributed by SPIC. SPIC' equity investment would be by way o export of plant and machinery and capitalisation of technical consultancy Off-shore loans might also be floated fo the project, he said, adding that th SPIC maintenance organisation woul be significantly involved in the Jorda project. Mr. Rajendran said modernisation of SPIC's fertiliser plants at Tuticorin, at a cost of about Rs. 100 crores had already been cleared in the June board meeting of SPIC. On Tidco disinvesting in Tuticorin Alkali Chemicals and Fertilisers Limited (TAC), another joint sector company, in favour of SPIC, Mr. Rajendran said there was willingness on the Tamil Nadu government's part to disinvest in TAC. However, in the context of SPIC's own financial requirements, the question of its acquiring TAC shares had to be considered by its board. Stating that Tidco had large holdings equalling 46 per cent of equity in TAC, Mr. Rajendran said the government's idea was to maintain Tidco's 26 per cent holding some flagship companies like SPIC. As such companies themselves served as promotional agencies. ''The idea is to disinvest and enter new promotional venues,'' he added.

Regarding the problems faced by TAC due to the changes in the centre's retention price formula for ammonium chloride, a key product manufactured by TAC, Mr. Rajendran said the state government had written to Centre on the issue.

FOR YOUR REGULAR REQUIREMENTS OF:

**GLYCINE PURE/USP**

**HIPPURIC ACID**

**CALAMINE POWDER IP/BP**

**AMMONIUM CARBONATE**

**AMMONIUM CHLORIDE**

Please Contact Manufacturers

**M/s. FREZCO CORPORATION**

Shanti Nivas, 8th Road, Khar,
Bombay 400 052.
Phone: Office: 6322847; Resi.: 6493549, 6484131
Telex: 011-79303 FC-IN

## THE FRANCAISE PETROLE (IEP) FOREIGN TIE-UP FOR IOC, BPCL

Bharat Petroleum Corporation and Indian Oil Corporation will have technical collaboration with two foreign firms to manufacture petroleum products. While Bharat Petroleum will collaborate with Shell Research Ltd. of UK, the French collaborator of the Indian Oil Corporation will be Institute Francaise Petrole (IEP).

# ONGC measures to cut energy consumption

As a part of its drive to reduce the internal energy consumption, the Oil and Natural Gas Commission (ONGC) has taken several measures.

According to a spokesman of the western region, the total energy required to produce a tonne of oil has come down from 283.2 kw hours in 1988-89 to 226.3 kw hours in 1989-90. This has been a result of the energy audit studies conducted by the organisation for close monitoring of the energy consumption at the various installations and work sites and the use of energy efficient equipment.

According to the spokesman, energy cells have been created at the corporate, regional and project levels for monitoring energy consumption levels and creation of energy data base, promoting use of of energy-efficient equipment, encouraging use of gas for power generation, development of non-conventional sources of energy and creation of awareness among users.

In house energy audits have been initiated at the corporate and regional levels for monitoring the consumptiopn in various areas of operations. Regular energy audits have succeeded in identifying and locating energy intensive units and plants and are helping in specific improvement programmes, he added.

The consumption patterns of various operations in the region are analysed and strategies to cut the consumption rate are evolved continuously. In fact, the targets have already been fixed to reduce the energy consumption by five per cent in 1990-91 in various areas of operation.

The use of energy-efficient equipment at ONGC with the necessary modification in place of obsolete energy guzzles has made considerable impact on energy conservation, and helped in saving costs to the extent of Rs. 50 lakhs per annum, the spokesman said.

The soft starters used in sucker rod pumps have helped in saving around 3.78 lakh units/year. The efficient use of electricity by using low voltage lamps and electronic regulators has brought about a saving of 15 lakh units. Expandor compresser at LPG plant, Hazira, has helped in saving about 28.5 million units per year as compared to conventional compressors. The co-generation plants at Hazira and Uran have resulted in saving of about 40 million units per year on account of waste heat recovery.

The optimum utilisation of power packs has resulted in reducing the consumption of high speed diesel (HSD) per metre drilled in the southern region. The consumption level of HSD has come down from 129 litres/metre in 1988-89 to 119 litres/metre in 1989-90.

In Bihar the innovative use of burnt oil in mud preparation at the Ganauli drill site has brought about a saving of 10,000 litres of HSD. At Tripura 18,790 kwh of energy was saved by using high pressure sodium vapour lamps in place of conventional lamps. Similarly 720 kwh of energy was saved due to installation of solar street lights at Betiah in West Bengal. The replacement of magnetic chokes with electronic ballast at Dehra Dun, Ankleshwar and Delhi has saved another three lakh units per day, he added.

There are about 84 oil and gas well platforms in the western offshore, which feed the hydrocarbons through a complicated network of feeder lines to the 16 major oil and gas processing and pumping complexes. These platforms are situated in the sea and it is neither practical nor economical to meet the power requirement of these loads from a shorebased power station. In order to optimise the use of gas which is available in plenty, it is convenient to utilise gas turbine driven generator packages on the respective platforms to meet the individual power requirements of these platforms.

There are at present 32 gas generator packages in western offshore to cater to the power requirements. These generators collectively produce about 950 mw hour of energy per day.

A few of the areas where nonconventional sources of energy are being used in ONGC include solar thermal heaters in remote work sites, projects, residential buildings, hospitals, etc., with a capacity of about one lakh litres of hot water per day, thus saving about eight lakh units of electricity per annum. More such water heating units are under installation.

Solar photovoltaic cells at offshore wells platforms have helped in saving about 3.45 lakhs units per year. A solar-powered cathodic protection system has also been installed for the Dabka-Dhuvaran pipeline in the western region, which has saved about three lakh units per year.

A breakthrough in tapping wind energy has been achieved by installing a 1,000 watts wind-driven generator on unmanned platforms of Bombay High. Solar cell and wind mill generator sets at wellhead platforms are utilised to generate power for charging battery banks of navigational aids and emergency lights.

A feasibility study for setting up a 10 mw windfarm in Mehsana has also been carried out. A pilot test using CNC in place of diesel/petrol in various types of vehicles, motors and generators have been conducted successfully in Bombay, Tripura and southern region. ONGC plans to invest Rs. 3 crores on its CNG programmes during the Eighth Plan with 38 refuelling stations, 300 kms of pipelines and 35,000 conversion kits to be installed in select metropolitan areas. This will go a long way in reducing the pressure on middle distillates.

Building up of awareness among the public and educating the general users assumes significance for any programme to succeed. For this purpose various methods have been adopted for spreading energy conservation consciousness. Colourful stickers and posters have been distributed and displayed, energy bulletins have been started, video films on energy conservation are being shown at various work centres. Also, energy conservation weeks are being celebrated to further instil the conservation culture among the employees.

Regarding future plans, the spokesman said, it is proposed to widely adopt energy saving measures by using viable frequency drives, soft starters, speed controllers, improvement in water makers, standardisation of lubricants, various forms of waste heat recovery, more efficient lighting practices, etc., for more efficient use of energy.

Solar energy is envisaged to play a more imporatant role in the future for water heating, distillation plants, navigational aids for offshore structures, cathodic protection against corrosion for oil and gas pipelines, etc.

Wind energy is proposed to be exploited for energy generation in some of the onshore and offshore installations. The matter is under discussion with the State nodal agencies for assessing the feasibility. Also scope for electricity generation in proven areas may be explored for the consumption of State Electricity Board.

## LATEX GLOVES UNITS IN CRISIS

Most of the 30 export-oriented latex gloves units have been forced to suspend operations, according to Gloves Manufacturers Association of India (GMAI).

This is because Indian producers are finding it difficult to compete with Malaysian, Taiwanese, Thai and Chinese units, according to Mr. Sharat Chandra, convenor of the association. The south-east Asian producers are able to avail of lower cost of production as a result of availability of cheap latex at subsidised prices, cheaper utilities like LDO and furnace oil and cheaper freight rates to United States, Europe and Australia, the GMAI has said in a representation to the ministry of commerce.

The south-east Asian countries have formed marketing consortiums, which gives them an advantage vis-a-vis the lack of identity and image of Indian manufacturers. They are also getting working capital at low interest rates and have lower debt service costs.

There are 10 glove units in Cochin Export Processing Zone (CEPZ), five in Madras EPZ, besides 15 hundred per cent for almost Rs. 45 crores of investment, out of which about Rs. 37 crores is in foreign exchange. Together, they have an export capability of Rs. 50 crores per annum and a capacity of 1200 million pieces, providing employment to about 2500 people.

The GMAI has made the following suggestions to rescue the industry from the present crisis. One is to increase the natural rubber subsidy on Indian latex to "realistic levels" so that the difference between global and Indian prices is neutralised. It has said that glove units in Malaysia and Thailand get latex at about 25 per cent less than their respective export price of latex because of the export levies charged by their governments.

## CFTRI TRANSFERS 22 PATENTS FOR COMMERCIAL USE

Twenty-two processes developed by the Central Food Technological Research Institute (CFTRI), were transferred to 37 parties for commercial utilization, during 1989-90.

These processes relate to the manufacture of potato flour and dry flat chips, pectin, N-triacontanol, sugarcane juic bottling, wax emulsion formulatio dessicated coconut, beneficiation of sun flower seeds, dehulling of musk melo seeds, fish pickle, potato wafers, garli powder, cattle and poultry feeds, edible groundnut flour.

Potato chips from dehydrated slices, integrated processing of mustard seeds, dehydration of green chillies, aflatoxin decontamination in groundnut oil, pickles and chutneys, baking powder, tomato ketchup concentrate, tomato ketchup from tomato paste, accelerated process of mango processing and dehydrated vegetables were also transferred.

## GOVT. ALLOWS DMT, PTA IMPORTS AGAINST ADDITIONAL LICENCES

The Union government seems to have virtually acepted the polyester industry's demand for placing imports of DMT and PTA under OGL by allowing the imports of this basic raw material against the additional licences granted to export and trading houses.

At the same time, the government has also permitted the import of paraxylene against additional licences to export trading houses, which would help meet the requirement of Bombay Dyeing for producing DMT. It is the only DMT producer in the country without capitive paraxylene production facility and depending entirely on the imports to meet the raw material requirement. The polyester yarn and fibre manufacturers feel that it would check any unnecessary rise in the prices of DMT/PTA and would help stabilise its prices.

They pointed out that at present the landed cost of imported material would be slightly higher but it would prove a deterrent to the domestic manufactuers for raising their prices substantially, apart from ensuring adeuqate availability.

# ONGC keen on developing well off Nagapattinam

The Union Government is processing the issue of investment decision on the development of the offshore PY-3 oil and gas structure, 55 km north-east of Nagapattinam. The Oil and Natural Gas Commission struck a sbustantial quantity of oil and associated gas from the PY-3-2 well in the structure. It is flowing about 4,000 barrels of oil and about one lakh cubic metres of gas a day.

The ONGC is keen on developing the structure and start producing the oil and gas. It has prepared feasibility reports on the production of oil and gas from the PY-3 field and on production of free gas from the PY-1 structure, off Porto Novo. The PY-1 is flowing out four lakh cubic metres free gas a day. Production from the PY-3 field will have to await environmental clearance from the Union Government.

According to the ONGC sources, wherever oil and associated gas were struck in the same well, production of both would start simultaneously so that there was no flaring of gas. "We will develop no field in future unless gas is used simultaneously". The ONGC is drilling now at 10 locations in the Cauvery basin. They include nine onland sites and one offshore location. The onland locations include three new structures in Thanjavur district — Vengadathangal, Neduncheri and Thattankovil. Exploratory wells are already being drilled at Vengadathangal and Thattankovil. The development wells would be drilled at Nannilam, Narimanam and Adiyakkamangalam. The offshore well, is off Pondicherry. The average depth of the exploration wells would range between 2,400 metric and 3,800 metres.

"Every structure where oil has been discovered onland in the Cauvery basin has been put under production", the sources said. The same situation obtained in the Krishna-Godavari basin in Andhra Pradesh, where all the onland oil wells had already started producing crude. The included Kaikalur, Mori and Lingala structures.

The ONGC has resumed normal drilling activities in the Krishna-Godavari basin after the losses it suffered in the cyclone of May last. It lost property worth Rs. 50 lakhs when tents and other camping material were swept away at Nellore, Mopidivi and Kaikalur. Currently, drilling is under way at Mandapetta, Bantumilli, Palacole, Pasarlapudi, Sarapalli, Manepalli and Junalanka onland at Ravva-24 and Ravva-31 in the offshore area. The Government of India has given environmental clearance to the ONGC to establish an oil and gas terminal at Surasanyanam, near Kovvur in Andhra Pradesh. The terminal will process the oil and gas from the Ravva offshore structure, where substantial quantities of oil and gas have been discovered. It would have oil stabilisation and dehydration unit, storage and despatching facilities, a cooling system and an effluent disposal system.

The terminal will be a primary processing facility to process 8,600 barrels of oil and 0.2 million cubic metres of gas a day, which would later be sent to a refinery.

---

## ONGC IN 'TOP TEN'

---

The Oil and Natural Gas Commission (ONGC) has been ranked seventh among the "most profitable" industrial corporations of the world, according to the recently released "Fortune's global 500 listing" for 1989.

The ONGC dominates in the global reckoning due to its high returns on sales which is the prime criterion for assessing profitability.

Among the 52 world oil companies featured in the list, the ONGC occupies number one position for its highest return on sales, according to an ONGC release.

*Available*

SODIUM NITRITE
BLEACHING POWDER
BORAX & BORIC ACID
(Granular/Powder/Crystal Form)
CALCIUM CHLORIDE FUSED/SOLID
NICKEL CHLORIDE/SULPHATE

Please Contact:

**DIPPYS SALES PVT. LTD.**
*Regd. Office:* 230, Samuel Street, P.B. No. 3075, Bombay 400 003.
Phones: 322571/323548/345701 * Telex: 011-76842 DIPY IN Grams: DIPPYS

# ONGC move to hire drill-ships runs into rough weather

Nearly two years have passed since the Oil and Natural Gas Commission (ONGC) floated a tender for the supply of two drill-ships on charter-hire for exploration of Indian waters, but no work has started as yet.

The government's indecision over the awarding of a contract to one of the shortlisted perties, and the failure of another such party to mobilise a suitable drill-ship so far, are chiefly responsible for the consequent setback in ONGC's exploration programme. The two drill-ships were proposed to be employed for a two-year period beginning September last year.

The tender, which was issued in November 1988, received bids from 10 Indian companies, of whom seven were shortlisted when the bids were opened on January 27, 1989. Jagson Internatioanl was the lowest bidder at a rate of Rs. 2,88,265 a day as charter hire, followed by Hitech Drilling, Essar, Aban Loyd, and Bombay Offshore Suppliers Services, though not in that order.

As required under the regulations, the proposal to award the contract to Jagson was forwarded by the ONGC and a specially-constituted inter-ministerial steering committee to the government for approval in May 1989. The approval has not come as yet, for reasons unknown. Since this proposal was stuck, the ONGC asked the other bidders to match Jagson's offer, so that the contract for the second drill-ship could be awarded. Aban Loyd was the sole bidder this time, and a contract was finally awarded to it, on condition that it mobilises a suitable ship.

Aban Loyd's contract also ran into trouble, as the drill-ship identified by it, Five Star, was rejected by the Government, as it did not conform to minimum specififcations with respect to the age of the vessel. Aban is believed to have forfeited its bid of about Rs. 13 lakhs as a result of this. Subsequent efforts by ONGC to convince the other bidders to opt for the contract at the rates offered by Jagson have failed.

The contention of some of the other bidders is that the rate of Rs. 2,88,265 a day as charter hire is uneconomical in today's conditions. Bombay Offshore, for one, has written to the government that its daily operating costs and finance charges on its drill-ship, Boss Vishwa, are in the region of Rs. 3.9 lakhs, and that it would be prepared to accept a contract at a rate of Rs. 4.3 lakhs a day. Bombay Offshore and Essar Shipping are the only two Indian companies tha own drill-ships that conform to the government's specifications, and can b employed for the exploration work tha this tender sought to initiate. All th other bidders sought to either buy drill ships or lease them from abroad to execute the contract. In fact, Bombay Offshore had bought Boss Vishwa in June 1989, with an eye on this contract, at a price of $12 million. Today, after more than a year of unemployement, Bombay Offshore is under pressure from its bankers to sell the vessel.

It is unlikely that ONGC will be able to persuade any Indian or foreign party to accept the contract for the drill-ships at rates prevailing two years ago. Not only has the dollar risen from the November, 1988, level of Rs. 15.60 to over Rs. 17 today, but charter-hire rates for drill-ships, too, have risen, during the same period, from about $18,000 a day to about $25,000 today.

ONGC may have to go in for a retendering of the proposal, but here again, oil industry insiders point out that it will be too late for the September, 1990 season even if the fresh tender is issued tomorrow.

This means that the exploration work that was to have been carried out from last September will not begin this season as well.

Cyclohexanone Cyclohexane
Mix. of Cyclohexanol & Cyclohexanone
25
CRESCENT
SILVER JUBILEE
MANUFACTURED BY:
Gujarat State Fertilizers Co. Ltd.
BARODA
Please Contact Authorised Distributors:
Crescent Chemicals

Sales Office:
56-B, Sanjay Bldg., No. 5, Mittal Estate
Andheri-Kurla Road, Bombay 400 059.
Tel: 6329110/6322136/6300157/6343555
Telex: 011-72284 CRES-IN
Grams:CRESOLVE, Bombay - 400 009

Branch:
5-E, Vasant Kutir,
R.C. Dutt Road.
Baroda - 390 005.
Phones: 324313/322279/320128
Grams: CRESCHEM, Baroda 390 005

# Record Khetri output

The Khetri Copper Complex (KCC), the largest integrated mining-cum-metallurgical unit in the country, has achieved record production during 1989-90 and hopes to improve it further during 1990-91.

KCC, a major constituent of the Hindustan Copper Ltd., (HCL), a public sector enterprise, produced 28733 tonnes of cathode copper during 1989-90, surpassing the previous best of 27864 tonnes and 20850 tonnes of wire bars, bettering the previous record of 18354 tonnes, the Executive Director of KCC, Mr. P.M. Chickabassavaia said. KCC with an installed capacity to produce 31,000 tonnes of electrolytic grade copper per annum has three mines —two underground and one open-shaft. The underground mines are at Khetri and Kolihan while the open-shaft mine is at Chandmari.

The plant at Khetri consists of a concentrator, a flash smelter, an electrolytic refinery, a wire bar casting plant and an acid-cum-fertiliser plant. The Dariba copper project, situated about 180 km from Khetri, also forms part of KCC and has a capacity to produce 100 tonnes per day. During 1990-91, KCC proposes to produce 27,000 tonnes of blister copper, 36,000 tonnes of cathode copper, 20,000 tonnes of wirebar, 80,000 tonnes of sulphuric acid and 80,000 tonnes of fertiliser, Mr. Chickabassavaia said.

Further, he said KCC alongwith the Mines Exploration Corporation has located a reserve of 20 million tonnes of copper ore near Khetri. According to initial reports it is having two per cent of copper metal and was expected to yield 2000 tonnes of copper per day after four years of development work. Hindustan Copper Ltd., set up in 1967 has taken up exploration prospecting and mining activity for minerals, in particular copper, extraction and fabrication of metals and manufacture of products, alloys and by-products.

It is also engaged in developing a system by which the country can utilise the nodules recovered from the sea bed. Thus, he said HCL's operations have been successful to a large extent in fulfilling the long-term objective of the nation for development and growth of copper industry on sound lines by adopting appropriate technology to maximise the indigenous production of copper.

---

## ZINC, COPPER PRICES HIKED

The Minerals and Metals Trading Corporation (MMTC) has further increased the ex-godown selling prices of zinc following rise in its prices in the international market, and reduced further the prices of nickel following weakening of dollar.

In a press release issued recently the corporation said the prices of copper and lead have been increased due to appreciation of pound sterling. The release said the prices are effective for the month of August and excluding sales tax and octroi duty.

The prices of zinc electrolytic high and special high were raised by another Rs. 500 each to Rs. 53,000 and Rs. 53,200 per metric tonne while nickel sqrs/briqs/pellets and nickel strips/f. shorts fixed further lower by Rs. 3,000 each at Rs. 3,44,000 and Rs. 3,47,000 per metric tonne, respectively. Copper electrolytic wire bars and copper continuous cast wire rods were raised by Rs. 1,500 each at Rs. 85,500 and Rs. 91,000 per metric tonne. Prices of pig lead 99.97 per cent and 99.99 per cent were also higher by Rs. 1,000 each at Rs. 35,000 and Rs. 35,200 per metric tonne respectively.

---

## MINERAL PLANT: TN PACT WITH IRE

The Tamil Nadu Government and the Indian Rare Earths Ltd. (IRE) have signed an agreement for setting up a joint venture mining and mineral processing project at Kudiraimozhiteri, about 50 km from Tuticorin. The project to be set up at a cost of Rs. 40 crores would have an annual turnover of Rs. 30 crores, according to an IRE spokesman.

The project, at full capacity, would achieve an annual production of one lakh tonne of ilmenite, 6750 tonnes of rutile, 3500 tonne of lucoxene, 5000 tonne of zircon and 4500 tonne of sillimanite and 400 tonne of monozine, the spokesman said.

He said IRE had been considering setting up new projects to exploit mineral deposits found in different parts of the state's Nellai Kattabomman and Chidambaranar districts. Adding there was increasing demand, both domestic and international, for minerals like ilmenite, rutile and zircon.

The mineral deposits found at Kudiraimozhiteri are estimated at about 240 million tonnes. The sand there is known as 'teri' (red), because of its reddish brown colour due to heavy ferrogenous coating on the sand grains.

---

## FEASIBILITY OF ALTERNATE FUELS BEING EXAMINED

A new government committee is looking at the possible introduction of alternate fuels in India's transport sector to cut down petrol and diesel consumption the country.

The 10-member team headed by Mr. Vineet Nayyar, chairman of the Gas Authority of India Limited, will examine techno-economical aspects of bringing an alcohol-based fuel or compressed natural gas to run vehicles in India. Several research groups have already established the technology for using alcohol blends and compressed natrual gas as fuel in vehicles. The issue now is whether it it will be economical, petroleum ministry official said.

# Impex code no. norms eased

New exporters will get impex code numbers immediately if their applications are vouchsafed by a star exporter, an export house or a trading house. The chief controller of imports and exports (CCI and E) has sent instructions to all offices under its charge to that effect, according to offical sources.

This follows a report appearing in a leading financial daily. The news item said that the delay in the grant of impex code numbers was hitting new entrants to export business. The time taken by various offices of CCI and E was about two months by which time the letters of credit would have expired. In some cases, foreign buyers even cancelled the orders placed on Indian exporters.

Earlier the code numbers were given within a week or so. The certification by a star exporter, an export house or a trading house would, no doubt, provide relief to new exporters in getting the impex code numbers without which they could not export the goods.

However, all new entrants to export business may not know the certifying exporters and, as such, their applications for code numbers would be dealt in the normal course thus causing the avoidable delay. The exporting community wants the commerce ministry to do away with the impex code numbers, particularly because exporters in any case, have to obtain code numbers from the Reserve Bank of India.

If the impex code numbers are also to be obtained, then the CCI and E should notify the timeframe for the disposal of applications from exporters, it is pointed out. Under the new import-export policy, an inter-departmental screening committee has to clear the credentials of the new exports before they are given the impex code numbers.

This committee includes joint chief controllers of imports and exports, and representatives of the concerned export promotion council and banks as well as officials of the income-tax and sales-tax departments. Official sources on their part, maintain that the scrutiny of applications is important to ensure that there is no leakage of foreign exchange in particular.

## STAR HOUSES CAN TRANSFER SPECIAL ADDL. LICENCES

The Commerce Ministry has allowed transfer of special additional licences isssued to star trading houses, according to a public notice (No. 46-ITC (PN)/90-93) dated July 24 issued at New Delhi recently.

In a significant liberalisation from the point of view of star trading houses, the Chief Controller of Imports and Exports (CCI and E) has notified that the licences will be issued in the name of the star houses and will be freely transferable in full or in part and this transfer would not require any endorsement or permission from the licensing authority.

Hitherto, the special additional licence issued to a star house was non-transferable. However, imports against these licences would be allowed to actual users (industrial) only. The actual users at the time of clearance of goods through customs shall furnish a copy of their industrial licence or registration certificate (RC) as an actual user along with a declaration that:

-the said imported goods will be used in the manufacture of the end product indicated on the said IL/RC.

-their IL/RC has not been cancelled or withdrawn or otherwise made inoperative, and-the items imported against the special advance licence are strictly in accordance with the terms and conditions of their IL/RC with sponsoring authority concerned as an industrial unit and their approved phased manufacturing programme (PMP). (A copy of PMP should be enclosed and if there is no PMP a declaration to the effect).

Import of office machinery as per th provisions contained in sub-para 227(3 shall be allowed to any actual user. Th goods imported under special additiona licence would be non-transferable an shall be subject to actual user conditions, the notice added.

## PACT WITH PHILIPPINES SIGNED

India and Philippines recently signe an economic and technical cooperatio agreement and identified new areas o trade and economic cooperation.

Both sides saw considerable scop for setting up joint ventures and transfer of technology in mini-cement plants automobile parts, agricultural machinery, drugs and pharmaceuticals industries.

The agreement followed wide-ranging talks between the visiting Philippines Foreign Minister, Mr. Rau Mangelpur and the Commerce Minister Mr. Arun Nehru. The agreement aims at a sound development of industrial co-operation, promotion of capital investments and co-operation in the field of transport, communications, construction and energy.

The two-way trade of Rs. 64.41 crores reflected a very low percentage of the total global trade of the Philippines. Indian exports to the Philippines were worth about Rs. 43.14 crores and imports accounted for Rs. 21.87 crores.

## APPOINTMENTS

**Mr. P.C. Prakash**, Secretary (Petrochemicals) in Andhra Pradesh Government has taken over as the new Managing Director of Godavari Fertilisers and Chemicals Ltd., in place of Mr. M. Gopalakrishna who will be taking over as the Additional Secretary, Department of Mines in the Union Government.

# Company Notes

## POLYCHEM REPORTS GOOD PERFORMANCE

Polychem has brought cheer to its shareholders by declaring a bonus issue for the second year in succession. Last year, Polychem had issued a 2:3 bonus. The directors have once again, recommended a 2:3 bonus perhaps the first time any Indian company has issued a second bonus in 12 months.

The results of the company shows another year of performance for the year ended March 1990. Though the sales have been maintained at Rs. 112 crores, the profit after tax is up substantially from Rs. 5.28 crores in the previous year to Rs. 6.56 crores, an increase of 24 per cent.

Mr. Tanil Kilachand, Managing Director, while explaining the performance of the company stated that Polychem's strengths lay in its diversified product base. In the last year, the prevailing price conditions in the polystyrene and styrene monomer markets have been unfavourable. Production of these products curtailed as they were available at cheaper price under OGL imports. Despite this, the company has shown an improved performance by substantially increasing both production and sales of other products like VAM, ABS and liquor products.

During the year, Polychem has successfully commissioned a Rs. 22 crores polyvinyl alcohol plant, with a capacity of 2,000 mtpa. The company has also completed a Rs. 17 crores expansion of the ABS plant. Nearly Rs. 40 crores have been financed through internal resources, loans and debentures, thereby raising the assets base and equity value of the existing shareholders.

Over the next three years, the company has substantial expansion plans of approximately Rs. 200 crores. The largest project is an integrated complex for the manufacture of 80,000 mtpa of styrene monomer and 40,000 mtpa of polystyrene. The Government has approved this project and work has commenced on all fronts to ensure a speedy implementation. The other projects include a 7500 mtpa acetic acid plant, expansion of the VAM capacity from 10,000 to 15,000 mtpa and the expansion of ABS capacity from 5000 to 20,000 mtpa.

Meanwnile the company has maintained the dividend at 25 per cent on the enhanced capital resulting from last year's bonus. It has earned a gross profit of Rs. 10.74 crores against Rs. 10.55 crores last year. After depreciation (Rs. 287.79 lakhs against Rs. 231.96 lakhs), taxation (Rs. 130 lakhs against Rs. 295 lakhs), and other adjustments the profit amounted to Rs. 612.26 lakhs against Rs. 343.61 lakhs.

The proposed equity dividend will absorb Rs. 159 lakhs against Rs. 90 lakhs.

## RELIANCE PRUNES DIVIDEND

Reliance Industries Ltd. (RIL) has declared that its directors had proposed a reduced dividend of 30 per cent for the year ended March 31 against 40 per cent last year.

RIL said this year's net profit stood at Rs. 90.50 crores after providing Rs. 44.01 crores as expenses and losses in the July 1989 floods at its Patalganga plant which had been charged to various heads like damaged or unsold stocks, plant and machinery shut down, repairs and reconditioning.

However, the bluechip company registered record sales of Rs. 1856.30 crores against Rs. 1120.33 crores for the earlier nine-month period. Gross profit for the period amounted to Rs. 252.47 crores (against Rs. 166.17 crores) and the net profit was Rs. 90.50 crores (against Rs. 79.37 crores).

Though figures for the two accounting period were not directly comparable, after annualising the figures of the earlier period, they indicated that sales jumped by 24 per cent while gross profit increased by 14 per cent.

RIL said that exports amounted to Rs. 72.75 crores for the year against Rs. 20.14 crores in the nine-month period, posting a phenomenal increase of over 109 per cent. The directors had provided Rs. 161.97 crores against Rs. 86.80 crores for depreciation.

The proposed dividend would claim Rs. 45.64 crores. The national exchequer had received Rs. 698.39 crores in the form of various taxes for the period.

Against the paid-up capital of Rs. 157.92 crores, the company's net worth stood at Rs. 1087 crores and gross block at Rs. 1988.79 crores as on March 31. The debt-equity ratio stood at a very comfortable level of 0.55:1 indicating a potential to borrow over Rs. 2100 crores, it added.

## HARYANA PETROCHEM

The board of directors of Haryana Petrochemicals Ltd. have stepped up equity dividend to 20 per cent as against 10 per cent paid in previous year. The turnover of the company improved by 65 per cent and the gross profit before interest and depreciation has increased to Rs. 1086.44 lakhs (Rs. 399.86 lakhs).

After providing interest of Rs. 237.66 lakhs and depreciation Rs. 194.62 lakhs, the net profit comes to Rs. 548.19 lakhs as against Rs. 133.03 lakhs, registering an impressive increase of 300 per cent.

The company has taken up the second phase of expansion scheme at a cost of Rs. 52 crores for the installation of polycondensation plant of 7500 TPA to meet its captive requirements of chips. The spinning capacity would increase from 7000 to 9500 TPA.

The financial institutions have approved expansion of its spinning capacity from 9500 to 12,000 TPA at a cost of Rs. 1685 lakhs. The entire expansion is expected to be completed by June 1991, according to the company press release.

To part finance these schemes, the board has decided to issue shares on rights basis at a premium to be approved by CCI and also it is considering to raise long-term capital between Rs. 6 crores and Rs. 10 crores.

## S.I. VISCOSE DIVERSIFIES

South India Viscose Ltd. has diversified into manufacture of lignosulfonates in collaboration with Dresser Industries of the US. The new company, SIV-Magcobar, which is a Rs. 5 crore project, has started production. The product is a 100 per cent import substitution.

Disclosing this to newsmen Mr. G.S. Keswavamurthi, Managing Director, said that the new company is the first of its kind in South East Asia. He also said that the company has planned to manufacture industrial lignosulfonates soon.

Another facet of diversification is the incorporation of Bhavani Seeds Ltd. with a paid-up capital of Rs. 62.50 lakhs for the production of quality seeds to cater to the needs of the farming community in the South.

The company is also setting up of a plant at Palani for the production of edible oils, at a cost of Rs. 12 crores. The capacity of the new plant is 200 tonnes of seeds crushing and 100 tonnes of oil production per day. The solvent extraction plant will also refine and upgrade the edible oils produced.

It has planned to enter the tissue culture field in collaboration with a reputed firm. Negotiations are on, he added. SIV is also taking over the sick company, Mico Farm Chemicals Ltd., at Mettur, manufacturing basic pesticide formulations. The rehabilitation package has been submitted and SIV awaits the clearance from BIFR, Mr. Kesavamurthy diclosed.

The company has also taken over IAEC Boilers. The company has proposed to instal another viscose staple fibre plant at Sirumugai this year.

Group sales have risen to Rs. 132.66 crores as against Rs. 103.44 crores last year. The company has also achieved exports to the tune of Rs. 12 crores as against Rs. 4 crores last year. It is the largest exporter of rayon this year.

Due to larger profits, the company has declared a dividend of 45 per cent as against 35 per cent last year.

## TATA CHEMICALS

Tata Chemicals has produced satisfactory results during the year ended March 1990. The gross profit is up by 12 per cent to Rs. 75.94 crores from Rs. 67.80 crores last year.

The turnover has risen by only 5.93 per cent to Rs. 309.03 crores from Rs. 291.72 crores, indicating small improvement in the margins.

It has recommended a dividend of 30 per cent on the little larger capital of 491.69 lakh shares against 31 per cent on 449.19 lakh shares in the previous year. The dividend outgo has therefore moved up to Rs. 14.75 crores from Rs. 13.92 crores a year ago.

After depreciation (Rs. 19.20 crores against Rs. 17.51 crores) and taxation (Rs. 16 crores against Rs. 14.50 crores), there is an after tax profit of Rs. 40.74 crores against Rs. 35.79 crores last year.

The surplus profit is placed at Rs. 41.94 crores compared to Rs. 35.79 crores after adding the balance profit (Rs. 1.20 crores against nil) from the erstwhile Tata Fertilisers.

It has allocated (Rs. 5.36 crore against Rs. 3.50 crores) to the inves ment allowance reserve and (Rs. 0.4 crore against nil) to debenture redemp tion reserve, leaving Rs. 35.12 crore against Rs. 32.29 crores a year ago. Th bonus shares of one-for-two, as alread announced earlier, will qualify for th full dividend in the current yea 1990-91.

## KANORIA CHEMICALS RECOMMENDS 15 PC.

The board of directors of Kanori Chemicals and Industries Ltd. has rec ommended a dividend of 15 per cent o its enhanced equity capital for the yea 1989-90 (including bonus shares issue in June 1989 in the ratio of 2:1)

During the year, the company earne a gross profit of Rs. 563 lakhs agains Rs. 469 lakhs for the previous period Net sales rose from Rs. 51.14 crores to Rs. 74.55 crores. Net profit after provision for depreciation and taxatior comes to Rs. 107 lakhs.

A sum of Rs. 60.52 lakhs has been recommended as dividend against last year's Rs. 40.34 lakhs

During the year KCI produced 30,681 tonnes of caustic soda, 18727 tonnes of benzene hexa chloride, 6,962 tonnes of stable bleaching powder, 1518 tonnes of pentaerithrytol, 1,009 tonnes of sodium formate and 1632 tonnes of acetaldehyde. besides synthetic and cotton cloth and yarn at its textile unit.

The formaldehyde project at Ankleshwar in technical collaboration with Perstrop AB of Sweden was successfully commissioned in April 1990.

The company is taking effective steps for setting up a lindane project of a capacity of 412 tonnes at Renukoot. The company is confident of performing better in the current year.

## MONSANTO CHEMICALS

Monsanto Chemicals of India has reported improved results during the year ended March 1990. The directors have proposed to pay an increased equity dividend of 16 per cent against 15 per cent for the previous 15 months period.

The sales turnover of Rs. 521.56 lakhs for the year registered an increase of 14 per cent over the previous period. After deducting depreciation of Rs. 4.42 lakhs and tax provision of Rs. 20 lakhs, the profits after tax for the year work out higher at Rs. 20.25 lakhs compared to Rs. 21.44 lakhs an increase of 18 per cent over the previous period on an annualised basis.

After adjustments the amount available for appropriation (including the balance of profit brought forward from the previous period) is Rs. 25.17 lakhs compared to Rs. 21.59 lakhs.

## TAMIL NADU DADHA

Tamilnadu Dadha Pharmaceuticals has prompted a dividend of 15 per cent for the year ended March 1990 against 12 per cent for the nine-month period.

The turnover is up to Rs. 28.62 crores from Rs. 18.17 crores. The gross profit has risen to Rs. 102.02 lakhs from Rs. 96.27 lakhs in the past period. After depreciation (Rs. 54.76 lakhs against Rs. 35.40 lakhs) and taxation (Rs. 7.67 lakhs against Rs. 7.61 lakhs), the net profit is, however, lower at Rs. 39.59 lakhs against Rs. 53.18 lakhs in the past period. The proposed dividend will claim Rs. 24.82 lakhs against Rs. 14.73 lakhs in the previous period.

## MAFATLAL DYES

Mafatlal Dyes & Chemicals Ltd. has reported improved results for the year ended March 31, 1990 and the directors have recommended a higher equity dividend of 20 per cent payable on the enhanced capital absorbing Rs. 42 lakhs against 17 per cent paid in the previous 15-month period absorbing Rs. 28.56 lakhs on the old capital.

The company has achieved a turnover of Rs. 50.53 crores as against Rs. 42.11 crores during the previous period on annualised basis (Rs. 52.63 crores) and a gross profit of Rs. 2.25 crores against Rs. 2.23 crores in the previous period on annualised basis, (Rs. 2.78 crores). After provisions, the net profit works out at Rs. 1.14 crores (Rs. 1.19 crores-annualised).

The company's sales have improved by 20 per cent on annualised basis due to improved conditions in the textile industry.

## RAMPUR DISTILLERY

Rampur Distillery has reported improved working results for the year ended June, 1990. In the wake of a better performance, the directors have stepped up the equity dividend to 18 per cent from 15 per cent paid for the previous year.

The turnover during the year increased to Rs. 64.40 crores from Rs. 48.27 crores in the previous year and the gross profit to Rs. 5.28 crores from Rs. 3.11 crores. The net profit has been Rs. 3.61 crores (Rs. 1.51 crores).

According to Mr. Lalit Khaitan, managing director, the company achieved an all-time record capacity utilisation at its distillery as well as fertiliser unit. The capacity utilisation in the distillery has been 96 per cent while in the fertiliser unit it was 130 per cent.

## SHIVALIK FERTILISERS

Shivalik Fertilisers, a company of the Atma group of industries, has reported improved results for the year ended

PIPE & FITTINGS LIKE ELBOW, STUB END, TEE, FLANGE, REDUCER ETC. IN ALL QUALITIES OF STAINLESS STEEL. AS PER STD:

ANSI B 16.5, ANSI B 16.9, ANSI B 16.11 ETC.

- FORGED CARBON STEEL FITTINGS
- PIPES, FITTINGS, VALVES & EQUIPMENTS IN PP-PVC-FRP-HDPE.
- F.V. SIGHT GLASS IN S.S., M.S. & P.P.

- TOWER PACKINGS LIKE RASCHIG RINGS, INTALOX & BERL SADDLES, PALL RINGS, HONEY COMB ETC. IN CERAMICS, METALS & PLASTICS. (Sizes: 5 mm to 200 mm).

Ai AKSHAR industries

Kapurwala Building, 2nd Floor, 218-220 Samuel Street, Vadgadi,
Bombay 400 003. Phones : 341416, 346698.

March 1990. The sales have increased by 27 per cent from Rs. 19.22 crores (11 months period) to Rs. 26.63 crores in the same period. Net profit after tax has increased to Rs. 81 lakhs from Rs. 62 lakhs. The directors have recommended a maiden dividend of 10 per cent.

The company has now taken up, in view of the excellent demand for its product, a further expansion in the capacity of SSP plant from 1.32 lakhs tonnes to 1.98 lakhs tonnes TPA at a cost of Rs. 195 lakhs. This will improve the turnover and profitability of the company in the current year itself.

Moreover, expansion is also being pursued in the capacity of sulphuric acid from 49,000 tonnes at 82,000 tonnes per annum at a cost of Rs. 225 lakhs.

Application for an industrial licence for a paper plant with a capacity of up to 33,000 tonnes has already been submitted. This plant will not only make productive use of the waste heat and steam of the SSP plant but would also involve lesser capital outlay due to utilisation of existing infrastructural resources of the company.

In the first phase, this project will entail a capacity of 8,250 tonnes for which significant progress in terms of technology, plant design and demand survey has already been made.

## BHARAT FERTILISER

Bharat Fertiliser Industries has recommended 15 per cent dividend for the year ended March 1990 against nil in the previous 15 months. It has fared well with the gross profit spurting to Rs. 201.43 lakhs from Rs. 57.04 lakhs in the past period. The turnover has shot up to Rs. 21.15 crores from Rs. 12.60 crores. After depreciation (Rs. 71.60 lakhs against Rs. 88.91 lakhs) taxation (Rs. 4.45 lakhs against nil) and after certain adjustments, the surplus i Rs. 63.59 lakhs against a loss o Rs. 61.74. The proposed dividend wil absorb Rs. 30 lakhs. It has allocate Rs. 30 lakhs against nil to the genera reserve. The balance credit of Rs. 3.5 lakhs is to be carried forward against deficit of Rs. 61.74 lakhs in the previous period.

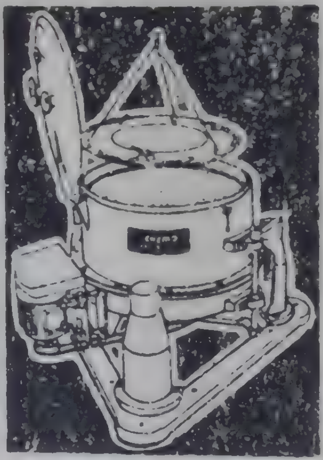
## GUJARAT MACHINERY

Gujarat Machinery Manufacturers, a joint-venture with Pfaudler Companies Inc of the U.S., which was been manufacturing corrosion-resistant glass lined chemical equipment for the chemical processing industry, has reported improved working results for the year ended March 1990.

The company has declared a final equity dividend of 40 per cent for the year. Together, with an interim dividend of 25 per cent declared in February, 1990 the total dividend of 65 per cent on the enhanced equity capital of Rs. 1.60 crores following the bonus issue in October, 1989 is equivalent to 80 per cent on the pre-bonus equity capital of Rs. 1.06 crores.

For the previous 18-months period ended March, 1990, the company had paid an equity dividend of 60 per cent, equivalent to 40 per cent on an annualised basis. The turnover during 1989-90 is Rs. 16.98 crores against Rs. 17.64 crores in the previous 18-month period, a rise of 44 per cent on an annualised basis. The pre-tax profit is Rs. 3.59 crores, showing a rise of 64 per cent on an annualised basis and the net profit is Rs. 2.23 crores. According to Mr. Ashok J. Patel, managing director, the record level of order backlog, a healthy balance-sheet, and improved profitability should enable the company to sustain a higher dividend level in the current year. The company hopes to meet the increased demand from all segments of the chemical processing industry which it caters to.

CHEMO
CENTRIFUGE
MACHINE
WITH
TOP RIM LIFTING
ARRANGEMENT
FOR
INSTANT DISCHARGE
FOR
CHEMICAL
PHARMACEUTICAL
AND TEXTILE
INDUSTRIES



CONTACT MANUFACTURER:
CHEMO FAB INDUSTRIES
Ram Baug, S.V. Road, Chincholi,
Behind State Bank Of India,
Malad (West), Bombay-400 064.
Ph.: Fac.: 6821401/6821695 Resi.: 6821894

Agent for Andhra Pradesh: Mr. M.N. Rao, **M/s. Anirudh Agencies,**
B-104, Badruka Enclave, Road No. 12, Banjara Hills, Hyderabad-500 034.

The reliable source of International Quality PIPERAZINES in India

**DIAMINES**

- **PIPERAZINE (PIP)**
  Intermediate for
  Pharmaceuticals
  Rubber Accelerators
  Corrosion Inhibitors
  Surface Active Agents
- **AMINO ETHYL PIPERAZINE (AEP)**
  Epoxy Curing Agents
  Corrosion Inhibitors
  Asphalt Additives
  Emulsifiers
  Pharmaceuticals
  Surfactants

**Ahmedabad (H.O) :**
1. National Chambers, Ashram Road
Ahmedabad - 380 009
Phone : 409626 Gram : DIAMINES

**Baroda (Works) :**
Plot No. 13, P.O. Petrofils - 391 347,
Dist Baroda
Phone 73305/406 Gram DIAMINES
Telex 0175 352 DACLIN

**Bombay Office :**
85, 'C' Wing, Mittal Towers, 8th Floor,
Nariman Point,
Bombay - 400 021 Phone 2029507
Gram CELAGAR

Another First. After Ethyleneamines.

**DIAMINES AND CHEMICALS LIMITED**
**International Quality with Indigenous Ingenuity.**

Navnit/306/89

Ahura

SPELLS QUALITY
SELLS QUALITY

82, MAHAKALI ROAD, ANDHERI (EAST), BOMBAY 400 093.

**PACKING BAGS:**

- **HDPE BAGS**
- **JUTE BAGS PLAIN & LAMINATED**
- **LDPE/HMHD LINERS**

**INDUSTRIAL CHEMICALS:**

- **NITROBENZENE**
- **COPPER SULPHATE - ISI**
- **COPPER PHTHALOCYANINE (CRUDE)**
- **ALUMINIUM SULPHATE NON-FERRIC**

Please Contact:

Mr. VASANT GIASOTTA
M/s. ANIL INDUSTRIAL SERVICES

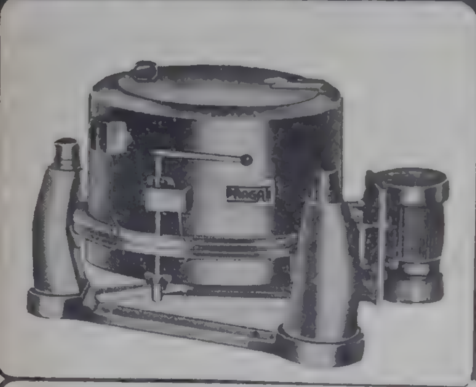
Mr. ANIL GIASOTTA
M/s. INPAC

407, Jolly Bhavan No. 2, Executive Centre, 7 New Marine Lines, Bombay 400 020.
**Phones: 298583, 298991, 294348, 298992 & 250955**
**Telex: 011-4220 FIRE-IN & 011-MBSC IN**

---

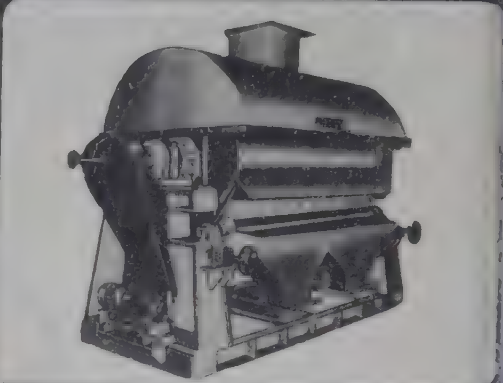
**PRAGATI** *the name of quality products.*

CENTRIFUGES



FLUID BED DRYER

CHEMICAL FLAKER



Manufactured by:
**PRAGATI ENGINEERING WORKS.** Plot No. N-8, Shed No. W-88 (A),
Chikhaloli, MIDC, AMBARNATH-421 501. PHONE: 2961.

---

**LOOKING FOR MERCURY SALTS?**

**Contact us immediately for super quality, competitive price.**

**Manufacturers of:**

MERCURIC CHLORIDE
MERCURIC ACETATE
MERCURIC IODIDE
MERCURIC NITRATE
MERCURIC SULPHATE
MERCURIC OXIDE
MERCURIC THIOCYANATE
OTHER METALLIC SALTS

M/s. L.S. CHEMICALS & PHARMACEUTICALS

10, Kotkar Industrial Estate, Off Aarey Road, Goregaon (East), Bombay 400 063.
**Phone: Factory: 692391 Office: 696963 Resi.: 6285735.**

**EXPORT ENQUIRIES ARE WELCOMED**

# Highlights in Chemical Technology (Part-2)

## UEL CELL CELEBRATED ITS 50TH ANNIVERSARY IN 1989

Sir William Robert Grove invented n 1839 the Grove Cell, which is lescribed as the world's first fuel cell. Therefore, fuel cell celebrated its 150th anniversary in 1989. The Grove Cell vas a primary battery comprising several small cells in glass vessels, with the electrolyte separated by clay tobacco pipe bowls. The positive pole was Zn and the negative Pt. The cell was demonstrated to the BAAS and Paris Academy. Grove realised that the current capabilities of his cell were bounded by the small area of each electrode, which concept he called the 'notable surface of reaction'. Scientists have been trying to optimise this ever since.

Grove's gas battery-the world's first working fuel cell — had two Pt strips both half immersed in dilute $H_2$ and $SO_2$also gave a current. Today fuel cell two electrodes and an electrolyte — rather like a battery-but continuously fed with fuel and oxidant. The fuel, which does not have to be a gas, must be reformed either internally or externally to produce $H_2$-rich reducing gas, which is fed to the anode. The oxidising agent (air or $O_2$) is fed to the cathode. The electrodes catalyze the oxidation and conduct electrons to a current collector.

The electochemical electrolyte interfaces and chemical energy is thus converted into electrical energy. The process should be 60% efficient and if the heat is also used, 90% efficient. Cells are usually switched in series or in parallel to give higher voltages and currents. This is called a fuel cell stack. Progress in fuel cell development was surveyed in September 1989 at the Grove Anniversary Fuel Cell Symposium held at the Royal Institution in London UK.

In recent years fuel cell research is at an increasing tempo in Japan and USA. The great interest in Japan may be partly because the country has no fossil fuel reserves of its own but this is only some of the story, since fuel cells (FCs) are not a primary source of energy and some other sources are needed to provide feed. The real answer is that FCs reduce fossil fuel consumption because they are efficient and give lower emissions of $NO_x$, CO and volatile orgnaics. However, $CO_2$ may still be producted depending on the fuel.

The green lobby is an important consideration in USA. The FCs can realistically be used in transport and recent legislation on emission has made FCs more attractive. Many developed countries are legislating for catalytic converters on cars and in the USA such measures have led to increased efficiency of the internal combustion engine, while decreasing emissions.

Research has shown that this investing in FCs today could answer our power needs for tomorrow. One FC power station built in USA for use in Japan can produce 4.2 MW, still a bit small for public use (a big coal-fired power station could produce 1000 MW. for example), but a step forward on the way. (*Chem. In Brit.*, 12/1989 p. 1185).

## X-RAY HARNESSED TO SORT OUT PLASTICS FOR RECYCLING

A technique for identifying and removing polyvinyl chloride (PVC) bottles in mixed plastics waste has been developed at the Centre for Plastics Recycling Research (CPRR, Piscataway N.J.). PVC and polyethylene terephthalate (PET) are difficult to distinguish from each other visually, and the ability to separate the two is critical, since even a small amount of PVC can damage PET molding machinery.

Plastic bottles are carried on a conveyor belt past a gamma radiation source and detector. As the beam strikes a bottle, the chlorine atoms in PVC present reflect some of the radiation, which is picked up by the detector. This triggers a blast of air to knock off the PVC-containing bottle off the belt. The instrument makes about 400 measurements per second, or about 200-300 per bottle, allowing PVC components as small as a bottle label or cap to be detected. The device has been developed as part of a project on automated sorting lines. CPRR is now working to improve the larger system's material handling capabilities. (*Chem Eng.*, 5/1990, p. 21).

## CHEMICAL COMPANIES IN USA PIONEER ENVIRONMENT AUDITS

Environment and purity of air and water is getting attention both from the Government and the educated public. As many chemical firms in USA now know, environmental violations can be costly to both profits and corporate image. Some managers are caught by surprise, when government inspectors arrive at their plants and issue fines. Hence company-wide audits of environmental compliance have increased sharply in the last 5 years in USA as well as in other advanced countries of Europe and Japan.

Reasons for the trend are clear. Rising public scrutiny and increased government regulations have made such auditing programmes ' close to a necessity' says a leading American consultant.

Grace Specialty Chemicals (New York) started a programme 3 years ago in part because of the changing regulatory structure.

What was acceptable according to the law in one area, was not necessarily the case in another locale. The Company had to develop a worldwide standard to continue to operate effectively. Grace completed in early 1990 an audit of its 90 major North American facilities. The Company reports the programme has given them a good basis for comparing how various sites operate. Auditors review air, water and hazardous waste programmes, as well as emergency response and safety activities.

Grace's audit system is similar to those of other firms. An audit team of between 3 to 5 people inspects sites at least once every 3 years and reports any discrepancies to local management. In its recent audit, the company also reviewed major operations in Latin America and Europe.

Not all firms audit worldwide operations according to the same standard. Audits are viewed differently within each company. Using the same standards worldwide would be difficult, but lot of companies feel they should be heading in that direction. A plant in Brazil, for example, would have a tough time disposing of hazardous wastes the same way it should be in USA, since Brazil lacks a mature waste disposal industry.

Globalization of US firms is also forcing them to start audit programmes. According to one leading authority in USA, as companies decentralize to become more competitive, they retain responsibilty for their environmental performance. Audits can keep them aware of potential problems. Audits are used, first of all as a management tool and secondarily as a compliance tool. (*Chem. Wk.*, 6/6/90, p. 17).

## USA-USSR COLLABORATION IN DIAMOND R & D

The US company Monsanto is to collaborate with the USSR in research on diamonds and diamond-like films for use in plastics. A research collaboration agreement has been reached with four scientific laboratories: two in the Institute of Physical Chemistry of Academy of Science of USSR, the Institute of Superhard Materials of Ukraine SSR and the Institute of Vacuum Machinery (USSR). Dr. Robert Janson, said the collaboration deal will combine Soviet scientific discoveries with Monsanto's ability to develop technology and commercial products. (*Chem. Wk.*, 5/23/90, p. 27).

## SUPER-PURE SILICON PRODUCED BY WESTINGHOUSE ELECTRIC CORP

Researchers at Westinghouse Electric Corp (Pittsburgh) report they have produced silicon crystals that are 4-times purer than any currently available material. The ultra pure crystals, with impurity levels of only a few part per 100 million, were grown at the company's Science & Techology Centre in Churchill, (PA) using a $2 million float-zone facility.

Westinghouse reports the material now being produced in 10 Kg cylindrical forms is intended for use in a new generation of infra-red detectors for space and environmental application. It will also be applied in semiconductor devices. A key breakthrough is the ability to make the ultrapure crystals in large sizes, which makes it more practical for manufacturing electronic devices. The current furnace is aimed at producing cylinders up to four feet long and 5 inches in diameter. (*Chem. Wk.*, 6/6/90, p. 32).

## HOECHST UNVEILS ADVANCES IN PP CATALYST

Hoechst (Frankfurt, W. Germany) is developing a new generation of high-yeild polymerization catalysts, primarily for use in polypropylene (PP) production. Dr. Volker Huelck of R & D division of Hoechst reveals that significant resources are being put into the project. Earlier this year, researchers started testing the product in a continuous pilot plant. Huelck reports that the catalyst is being developed for use in Himont's Spheripol PP process. An agreement signed with Himont (Wilmington Del, USA) in 1986 forces the German company to use the Spheripol catalyst until 1993.

While Spheripol is a bulk homopolymerization process, Huelck reports that development work indicates the catalyst could be used with other gas phase routes such as BASF's process and Union Carbide's Unipol technology.

According to Hoechst the new material is chemically different from the titanium-based catalyst now used for PP production. The new catalyst has improved activity and gives higher yields than the current generation.

Looking at the PP grades marketed worldwide, Huelch believes that no one else is currently using a new generation catalyst. However, from patent information the company knows other developments are under way in the field. This catalyst has produced new grades of PP in the laboratory. Furthermore, it appears the material can be used to make other polyolefins. Depending on certain conditions —finanical as well as geographical — the new catalyst may be offered under license.

Industry observers note that all PP majors are trying to develop systems to break the monopoly of the Himont/-Mitsui catalyst. One comments that while Himont currently offers the best catalyst, it asks too high a price and as a result users are working on 'Himont-free' systems. (*Chem. Wk.*, 6/6/90, p. 266).

## A GLASS FURNACE METHOD TO CLEAN CONTAMINATED SITES

Dunston-Ceramics, (London, UK) is reported to have developed a technique for dealing with sites contaminated by industrial waste such as heavy metals and asbestos. The method involves turning the soil into a glass by melting it in a traditional glass furnace with additives ch as alumina, silica or limestone. bove 1580°C the organic constituents f the soil are burnt off and a molten ass is formed. This holds the contam- ants in an inert form and, when oled, can be used in road surface, dustrial pipes or abrasives.

The company is planning to open its rst commercial site in the south-east f England, which will recycle some 000 tonnes per day of soil. (*ECN*, /11/90, p. 35).

## ASF UNVEILS A NOVEL PP-ASED CAR BUMPER SYSTEM

BASF (W. Germany) recently devel- ped a new entirely polypropylene (PP) ased car bumper system, particularly uitable for recycling as only one mater- al is used. The system can also be recy- led thermally to produce energy and reaks down to give only carbon diox- de, water and inorganic glass fibre, ash. ts calorific value is reported to be com- arable to that of fuel oil.

The bumper system comprises three arts, a bumper bracket made of glass mat reinforced polpropylene, Elastro- reg; an energy-absorbent core of the P foam, Neopolen P; and a flexible umper cover made from an impact resistant reactor blend of the polyprop- ylene Novolen 2863 JX. The bumper shell is covered with a flexible, high strength paint. (*ECN*, 6/11/35).

## A NEW PROPRIETARY CHLORIDE PROCESS FOR TITANIUM DIOXIDE CAN EXPLOIT LOW GRADE MINERAL SANDS ORE

Sherwin Williams of USA has decided to commercialise the partly proven new proprietary technology called 'Chloride Process Titanium Dioxide Technology'. It has acquired the new proprietary technology from New Zealand's Fletcher Challenge.

The company confirmed recently reports about its intention to develop the partly proven priprietary technology with a view to establishing production but the company has no intention at present of entering the merchant market.

Instead the technology developed to pilot plant scale by Fletcher, will be fully commercialized to produce $T^1O^2$ products for use in Sherwins own paint business.

The company declined to reveal details on the proprietary process except to say that it could utilize low grade mineral sand ores. (*Chem Wk. Intl.*, 5/9/90, p. 12).

## INTERNATIONAL TECHNOLOGY LICENSING FAIR SCHEDULED FOR OCTOBER 1990 IN BRIGHTON (UK)

The International Technology Licensing Fair is scheduled for October 2-4, 1990 at the Metropole Exhibition Centre at Brighton, UK.

This Fair will provide an opportunity for private companies, universities and research establishments (either independently or in collaboration with national trade groups or licensing authorities) to present their license offers before senior technocrats from major UK, European and International companies seeking new products or processes to manufacture under licence (or seeking distribution rights leading to a licence).

## A NOVEL GLASS CLOTH FOR PRINTED CIRCUIT BOARDS DEVELOPED BY UNITIKA (JAPAN)

Unitika of Japan has recently unveiled a novel glass cloth having low dielectric constant specifically for printed circuit boards. This glass cloth is composed of silica-rich glass fibre (manufactured by Akzo N.V. Netherlands). The new cloth has been already supplied to laminate makers as samples.

There is a growing demand for printed circuit boards (having low dielectric constant) with high wiring density. This trend is due to increased commercialization of small sized OA equipment and video cameras. Printed circuit boards produced from the new glass cloth have a low dielectric constant of about 4 x $10_3$cps. These are capable of speeding up handling of electric signals and facilitate high density wiring.

## USA DEVELOPS A FORMULATION BASED ON VEGETABLE OIL & CELLULOSE FOR PRESERVING FRUITS & VEGETABLES

A cheap edible film formulation that can be applied to fresh fruits and vegetables to retard ripening has been recently developed by a US Dept. of Agriculture's (USDA) research chemist.

The base for the coating is commercially available oils or waxes and cellulose together with a vegetble oil emulsifier. According to Myras Carriedo, the research chemist who developed the formulation, the coating on fruits and vegetables extends the shelf-life of produce and allows it to be be stored at 70°F, a normal room temperature.

In tests conducted in Florida the film of the new formulation successfully retarded ripening of treated tomatoes, oranges and carambolas (Florida grown star fruits). After 14 days of storage only 40% of the tomatoes treated with the emulsified film began ripening, compared with almost 100% of the tomatoes without the coating. The tomatoes treated with the new film also had better colour and less fungal growth.

The researchers also found that the coating had a strongly beneficial effect on the flavour of mature pineapple oranges. After 8 to 10 days storage at 70°F, juice extracted from coated oranges contained up to 14-times more of the usual flavour volatiles. Volatile esters, which are fragrant compounds formed by the chemical combination of acids and alcohols, gives orange juice its fruity taste.

According to horticulture authorities in USA fresh fruits and vegetables suffer anywhere from 12% to 20% spoilage loss from the farm gate to retail outlets. Obviously, therefore, the USDA expect the fresh fruit and vegetable industry to be very interested in the result of this research.

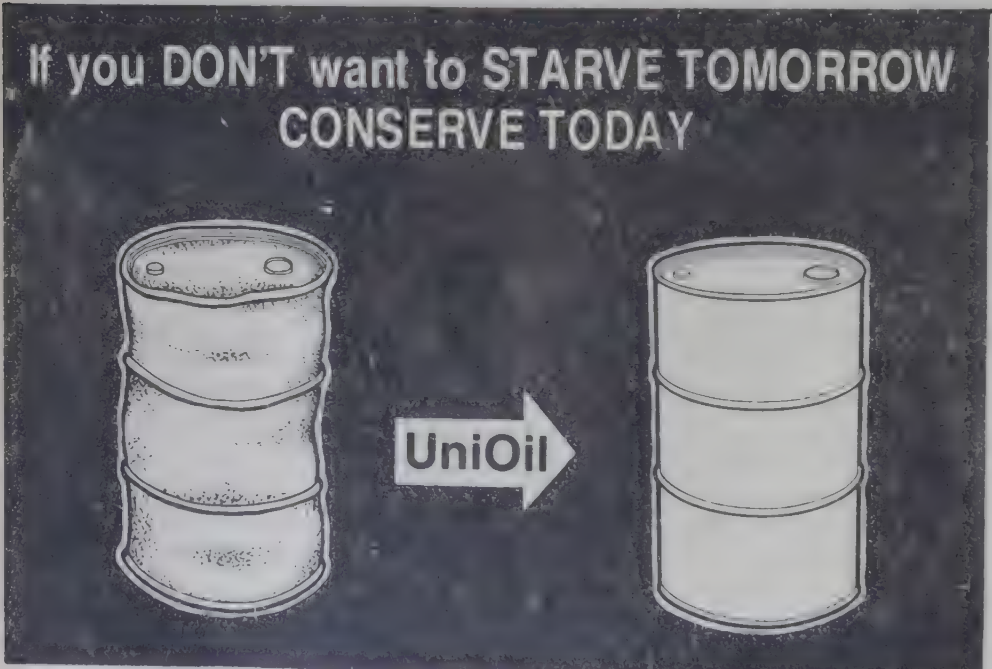
In India, due to improper handling and poor storage the fresh fruits and vegetables must be suffering anywhere from 25% to 40% spoilage loss, before, they reach the retail outlet. Further, even at the retail outlet due to lack of cold storage, there may occur further loss of 5%-10%. Therefore, the above coating formulation should be of particular interest for Indian horticulture and vegetabie farmers. The government should approach the USDA for the license for producing the above coating formulation indigenously and thereby save lakhs of tonnes of fruits and vegetables going to waste through spoilage. (*CMR*, 5/7/90, p. 13).

## SPECIAL PLASTIC PACKAGING PROJECTS AGAINST CORROSION

Hazorea — Effective protection against corrosion is available for metal objects, and especially machine parts, while they are being stored. Plastic packaging materials, manufactured by Plastopil, incorporate materials that help to prevent the oxidation of metal surfaces. Corrosion, research has shown, is an electrochemical process. A flow of electrons moves from high energy areas of the given metal object's surface to nearby lower engery areas. This microcurrent supports the formation of metal oxides — a highly undesirable phenomenon, since in most instances it is detrimental to the object's appearance, strength and functionality.

This process depends on the presence of an electrolite, such as water vapor, rusting is consequently greatly accelerated in very humid atmospheres. On the other hand, it can be slowed significantly by the presence of inhibitors, which absorb free ions and prevent their contact with the metal surface. One such class of inhibitors, known as "VCI" a (volatile corrosion inhibitors) are compounds with a vapor pressure higher than that of air, so that they tend to permeate the atmosphere of any enclosed space, in which they are found.

Developers abroad have managed to use VCIs as additives in the production of polyethylene films, from which they are gradually released. The atmosphere inside a bag made of such compounded plastic consequenly tends to be permeated with VCI, protecting any metal object stored in it.


If you DON'T want to STARVE TOMORROW
CONSERVE TODAY
UniOil

UNIQUE OILS INDIA LTD.
CAN SHOW YOU THE WAY

Their State-of-the-art drum reconditioning plant at Tarapur can bring back your old drums to AS NEW condition and give new lease of life to them. The process is cost-effective too. A large number of users of drums are reaping the benefits. WHY NOT YOU???

Their sophisticated used oil re-refining plant can purchase all your used lubricating oil for scientific re-refining. Give your used oil to them and prevent its use for spurious purposes. Contribute towards saving country's foreign exchange.

Contact:
**Unique Oils India Limited**
Regd Office: Arvind Chambers, 2nd Floor, (Gouri Studio Comp.),
194, Andheri-Kurla Road, Andheri (E), Bombay-400 069
Tel: 6347210/6320100 Telex: 011-79292 UOIL IN • Fax: 009122-636 4654
Factory: Plot M-4, MIDC Industrial Estate,
Tarapur, Dist. Thane, Maharashtra. Telex: 0132-236 UOIL IN Tel: 2892

Pulse

**FOR ACTUAL USERS/EXPORTERS**

**PARA CHLORO META CRESOL**
**SACCHARIN SODIUM**
**PARA TOLUENE SULPHONAMIDE**
**PARA SULPHAMIDO BENZOIC ACID**
**PARA TOLUENE SULPHONYL UREA**
**2-NITRO BENZYL BROMIDE**
**N-BROMO SUCCINIMIDE**
**N-CHLORO SUCCINIMIDE**

Contact:

**M/s. UNITED CHEMICALS**

190/3B, Mangaldas Building,
Mangaldas Road,
Bombay 400 002.
Tel.: 315368/294045/256433
Tlx.: 011-5235 UNIT IN
Cable: CHENUNI

AVAILABLE

*** Synthetic Khadi**
*** Cotton Khadi**

Contact Manufacturers:

**NEOPRINT**
**COLOUR & CHEMICALS**

101, Matru Chhaya, 378/380, Narsi Natha Street,
BOMBAY 400 009.

Phone: 348727, 336561

**V.V.Trans**
**Investments**
**Private Limited**

ANNOUCEMENT

EXCELLENCE
THROUGH
QUALITY

**V. V. TRANS**
**Investments**
**Private Limited**

ANNOUNCES
WITH PRIDE
THE COMMISSIONING
OF THEIR PLANT FOR
THE MANUFACTURE OF

**CHLORINATED**
**PARAFFIN**
**WAX**

(HNP / WAX BASED -
DIFFERENT GRADE)

FOR YOUR REQUIREMENTS
DEALERS/ACTUAL USERS
PLEASE CONTACT

**M/s. V.V. TRANS**
**INVESTMENT**
**PRIVATE LIMITED**

R.O. 43/262, New Sankalbagh
Narasinga Rao Pet,
Kurnool -- (A.P.)
**Telephone: 21381**
**Telex: 0815-216**

AVAILABLE IN
READY STOCK

**K. ACID**
**M.U.A.**
**M.P.D.S.A.**
**GAMMA ACID**
**4 N.A.P.**
(Swastic Organics)
**VINYL SULPHONE**
(Govind Dyestuff Pvt. Ltd.)
**BETA NAPHTHOL**
(Multi Organics Pvt. Ltd.)
**BON ACID**
(Abhideep Chemicals Pvt. Ltd.)
**RESIST SALT**
(Sulpho Chem)
**B.D.H.**
**CHRYSOPHENINE**
**D.A.S.D.A.**
**SULPHANILIC ACID**

Please Contact
**EMCO CHEMICALS**
208, Garodia House,
100/104, Kazi Sayed Street,
Bombay 400 003.
Tel.: Off.: 336868/345378
Resi.: 651504/6060413
*Associates:*
**RUCHIR DYE CHEM**

ATTENTION ACTUAL USERS/EXPORTERS
FOR YOUR REGULAR BULK REQUIREMENTS OF

SUPER WHITE : SUPER QUALITY

**ORTHO TOLUIC ACI**

WITH MODVAT FACILITIES
Please Contact:
**RAVI CHEMICAL WORKS**
Plot No. 41/1/28 & 47/1/29 GIDC Industrial Estate,
Nandesari 391 340. Dist. Baroda.
Phone: Works: 60472
Resi.: 320986 Baroda

SODIUM CHLORATE
AND
PER CHLORATES

ISI GRADE

PLEASE CONTACT:
**PANDIAN CHEMICALS LIMITED**
17-A, Vallabhai Road, Chokkikulam, Madurai 625 002
Telephone No. 42433, 42434, 42435
Telex: 0445-249 PCL IN
Fax: (91)-452-41151

QUALITY LABORATORIES SCIENTIFIC INSTRUMENTS

Autoclaves
Baths (Water, Oil, Viscosity, Low Temp.)
Colorimeters
Furnaces
Incubators
  (Bacteriological, B.O.D.)
Micro-Litre Syringes (for G.C. & H.P.L.C.)
Ovens
Petroleum Testing Instruments
Pumps, Vacuum
Stirrers (Overhead, Magnetic)

Thermometers (Stem type, inclusion, as per IP and ASTM)

Water Stills
Balances (Two-pan, Single-pan)
Centrifuges (all types)
Conductivity meters
Hot Plates & Heating Mantles
Karl Fischer Titrators
Microscopes (Mono, Bino, Stereo & Research)

pH Meters
Polarimeters
Refractometers (Abbes)
Tapes (Heating)

Viscometers

**C. ABHAYKUMAR & CO.**

Gopal Nivas, 127, S. Gandhi Marg, Bombay 400 002.
Grams: 'JITMARA' Telephone: 316397/295184

For Your Requirement of

**Calcium Carbonate**
(Activated/Precipitated Natural)

&

**Glycerine I.W./Refine**

*Mfg. by*

**Hindustan Lever Ltd.**
**Jay Lakshmi Oil & Chemical Inds. Ltd.**

&

**SOLVENTS * MINERALS * FINE CHEMICALS**

Please Contact:

**M/s. BHARAT ENTERPRISE**

3-A, AVSAR, 77-81, KAZI SYED STREET, BOMBAY 400 003.
Tel.: 329228/320626/344567 Tlx.: 011-73624 TLBE IN Cable: CARBONATE

FOR YOUR REQUIREMENTS OF QUALITY PRODUCTS

**PHENYLBUTAZONE I.P. OXYPHENBUTAZONE I.P.**
**TRIMETHOPRIM I.P.**
**& Intermediates**
**HYDRAZOBENZENE**
**DIETHYL MALONATE**

Contact Manufacturers:

**REINE CHEMICALS**
P.O. Box No. 6, GANDEVI - 396 360
**Phone: 363/393/563**

*For MAHARASHTRA Contact:*
M/s. **KHOKHANI ASSOCIATES,** 3rd Floor, Keshav Baug, 116, Princess Street, Bombay 400 002. Phones: 252244/252688

**KRISHNA CHEMICALS GROUP OFFERS**

| PRODUCTS | | MANUFACTURERS/EXPORTERS | PHONE |
|---|---|---|---|
| DIRECT CHRYSOPHININE GH | — | DALAL VADILAL MANEKLAL<br>DYE CHEM PVT. LTD. | 833347 |
| DIRECT CHRYSOPHININE GH | — | KRISHNA CHEMICALS | 830297 |
| 4 : 4 DIAMINO STILBENE<br>2 : 2 DISULPHONIC ACID | — | MANJU INTERMEDIATE | 831490 |
| DIRECT BLACK/E | — | ASHWIN INDUSTRIES | 831579 |
| DIRECT BROWN MR & GREEN B | — | NILESH DYE-STUFF | 831579 |

*Office : 23/24, Shankar Chambers, 2nd Floor, Nr. H. K. House, Ashram Road, Ahmedabad-380 009. (India)*
*Phones : (O) 440446/7/8/9 * (R) 493281/495281 * Telex : 121-6139 KRIC IN*

OUR MASTERY IN EXCELLENT QUALITY | EXPORT ENQUIRIES SOLICITED

(KNS-ADI)

For Your Requirements Of:

**FERRIC CHLORIDE (Anhydrous 98%)**
**FERRIC CHLORIDE (LUMPS)**

Please Contact Manufacturers

N3L

**NAVJEEVAN-O-CHEM**

Regd. Office :
Gawand Building, Khema Lane
Jambli Naka, Thane 400 601
Phone : 503593

Factory
Plot No. 5903-1, GIDC
Ankleshwar 393 002 Dist: Bharuch
Phone : 2938

# Science Briefs

## NVITRO MULTIPLICATION OF MULBERRY

Scientists have been successful in *in vitro* multiplication of single auxillary buds of mulberry, an economically important tree that is exploited for commercial production of silk. Mulberry gains importance as it is the chief source of food for the silkworm *Bombyx mori*. There are only a few reports of tissue culture of mulberry which is difficult to propagate through seeds.

Scientists at the tissue culture and pharmacogenic laboratory in the Viswa Bharati University, Santiniketan, excised auxillary buds from 15-year-old mature trees of *Morus alba* collected from the Central Sericulture Research and Training Institute, Behrampore.

After sterilising the explants, the researchers cultured them in a special nutrient medium supplemented by growth promoters.

When small shoots formed from the buds, the scientists transferred them to a special rooting medium to obtain plantlets with well-developed roots, which were gradually acclamatised and transferred to soil in the greenhouse.

Reporting their findings in the Indian Journal of Expermental Biology, scientists Sharmila Chattopadhyay, Soumitra Chattopadhyay and S.K. Datta said the response of the explants varied with the type of growth regulator used. The best response was obtained when the medium was supplemented with both auxins and cytokinins.

The results provide a practical method for quick *in vitro* production of the mulberry plant at a faster rate than conventional methods of propagation. The researchers found that a single axillary bud of the species may produce more than 20 plants within two months of culture, of whiich 80 per cent could survive after transfer to soil.

**P.T.I. Science Service,**
**July 16-31, 1990**

## PLANT EXTRACT REDUCES BLOOD SUGAR

Scientists at the Central Drug Research Institute at Lucknow have induced significant fall in blood sugar and simultaneous increase in plasma immunoreactive insulin (IRI) after single oral administration without influencing liver glycogen, concentration in albino rats using the hexane fraction of the plant *Swertia chirayita*, reports the journal "Indian Journal of Experimental Biology".

S. Chirayita (2.2 kg.) dried, powdered whole plant) was percolated with hexane (60-80 degrees celsius) thrice at room temperature. The combined percolates were concentrated under reduced pressure at 45 degrees celsius for complete removal of solvent leaving a certain amount of residue.

The marc (defatted plant material) was percolated thrice with rectified spirit at room temperature and the combined percolates were concentrated under reduced pressure at 45 degrees celsius for removal of all solvent. The crude concentrate was extracted thrice with hexane at room temperature and the combined hexane extracts concentrated for removal of all solvent leaving a sizeable quantity of the residue.

The experiments on three batches of albino rats clearly indicate that after 3-4 hours after oral administration of hexane fraction (single and multiple) significant fall in blood sugar is definitely accompanied by a significant rise in IRI level. It was also clear from the experiments that at least after multiple feeding of hexane fraction, the liver glycogen content is significantly increased three hours after the last dose. The study suggests the possibility that the hexane fraction of *S. chirayita* acts through its insulin releasing effects.

**P.T.I. Science Service,**
**July 16-31, 1990**

## DEVICE FOR RECOVERING HEAT FROM HOT FLUE

An indigenously developed heat wheel has a high heat recovering efficiency as compared to the conventional heat recovery device used for this purpose. The heat so recovered is used in the boilers in industries, reports "Research and Industry".

The device was developed at the Calcutta based Central Glass and Ceramic Research Institute. In many industries heat from hot flue gases is recovered for effecting saving in fuel consumption. For this purpose, regenerators and recuperators are employed. They recover heat from the outgoing flue gases for preheating the combustion air used in boilers. However, at low temperatures, the efficiency of conventional static regenerators is poor. For this purpose, the rotary regenerators (heat wheels) are more efficient (efficiency above 60 per cent at low temperature).

Heat wheel is a rotary regenerator which heats air continuously through a heat exchanger with hot flue gases from a furnace. It is a slowly rotating basket (with perforated bottom) filled with packings having high surface area and thermal shock resistance. The packing is heated by the flue gases which flow through one side of the cylinder and subsequently cooled down by the air (which extracts heat) on the other side, as the wheel rotates. The air heated by the hot packing can be used as combustion air in a boiler. The conventionally used metallic and ceramic rotary regenerators have many shortcomings. The innovated heat wheel is of hybrid construction have ceramic packing in a steel basket. The wheel casing is made of fire clay bricks at the upper half in the hot region and of metallic casing in the lower region. The wheel rotates at a speed of 1-3 rpm. There are special flexible seals at the bottom of the basket to prevent inter-chamber leakage. At the upper portion, there is a ceramic wall hanging from the top. In this way, leakage of hot air to flue has been restricted to 5-10 per cent of the air flow rate.

The invention has overcome the shortcomings of conventionally used metallic and ceramic rotary regenerators. Though the basic concept employed is the same as in the case of conventional systems, the innovated heat wheel uses loose ceramic packings as regenerator filler which has high heat transfer coefficent and low pressure drop. The new design involves a lower capital investment.

A prototype heat wheel of 84 cm diameter having 15 cm high packing has been built for operation with flue gas at 860 degree celsius. Trials carried out on this prototype has indicated effectiveness up to 79 per cent. Annual saving in oil consumption for one boiler of medium capacity is estimated at Rs. 1.28 lakhs.

**P.T.I. Science Service,**
**July 16-31, 1990**

## FIBRE OPTICS TECHNOLOGY

A totally indigenous machine for drawing optical fibres of uniform diameter has been designed and built by the Central Scientific Instruments Organisation (CSIO), Chandigarh.

The fibres can be drawn in a wide ranges of diameters. Employing these fibres CSIO scientists developed light guides with a maximum length of 1.20 metres. The light guides were supplied on request to the Terminal Ballistics Research Lab [illegible] (TBRL), Chandigarh, Punjab University, Chandigarh, and the National Physical Laboratory (NPL)

The institute has also developed prototypes of fibre optic clinical headlamp and twin-lamp cold light source, while a fibre optical laparoscope, important for family welfare programmes, is under fabrication. Other important devices under fabrication at CSIO include single and multimode directional couplers, multimode fibre connectors and jewel alignment approaches, says a newsletter of the organistion.

**P.T.I. Science Service,**
**July 16-31, 1990**

## ANTI-FILARIAL ACTIVITY OF CASHEW LIQUID

Cashewnut shell liquid preparation promises to be the effective drug of the future to combat filariasis, the number one health problem in Kerala. Cashwenut shell (CNSL) possesses "excellent" anti-filarial activity and has been found to be 70 times more active than the standard drug Diethylcarbamazine (DEC).

Researchers at Kerala university's department of biochemistry who conducted extensive laboratory tests with CNSL solutions say preliminary studies on laboratory rats had showed that CNSL was less toxic. "If it is proved to be successful in cattle, it may be so for humans too", they said in a report in the latest issue of "Cashew Bulletin", the monthly publication of the cashew export promotion council.

Filariasis is a major tropical diseases and the number one public health problem in Kerala. DEC is the drug of choice for the treatment of filariasis at present.

The two research workers selected the filarial parasite of cattle as the test organism of their studies. The parasite, *setaria digiata* was specially selected because of its established similarity to human filarial parasite "Wuchereria bancrofti". The adult parasite was a collected from a slaughter house in a tyrode solution. The CNSL was prepared from cashew apples from the university campus trees. A ratio of three worms in 100 ml solution was used in all the experiments and the minimum concentration required for killing the worms in six hours was worked out.

In the tests, while the minimum concentration for CNSL was 0.5 mg in a 100 ml solution, for DEC it worked out to 35 mg in a 100 ml solution. Thus it is clear that CNSL is seventy times more active than DEC.

Despite many industrial applications reported for CNSL, little attention has so far been given to its possible medicinal and biological value. The cashew apple juice is recommended by ayurvedic doctors for intestinal worms and infestations. CNSL derviatives containing chlorine or nitrogen are considered to be effective insecticides.

**P.T.I. Science Service,**
**July 16-31, 1990**

## TURNING PLANTS INTO PROTEIN FACTORIES

Plants might soon become new sources of proteins found in human blood and the brain. Scientists are now refining genetic engineering techniques to create new transgenic plants that can produce a range of bioactive proteins used mainly in research, but with potential use in medicine.

In a series of recent experiments conducted in the United States and western Europe, scientists transformed the genetic structures of potato and tobacco plants and oilseeds to get them to secrete a variety of biologically active proteins.

Conventionally bioactive proteins have been produced by extracting them from biological materials, by chemical synthesis or through genetically-engineered microorganisms like bacteria. But technical and economical drawbacks have often hampered such procedures and large scale production of the proteins has been difficult.

Researchers believe transgenic plants

uld be suitable alternatives to genet- lly engineered microbes, since the oduction of plant biomass is relatively expensive. "This aspect is important cases where large amounts of protein ed to be produced", according to a am of scientists in Netherlands who gineered plant genes to make them oduce human serum albumin, a pro- in found in human blood. The albu- in secreted by the plants is distinguishable from the authentic otein, the biologists said in a report the journal 'Biotecnology'.

One of the first studies in getting lants to produce biologically active aterials was conducted by a team of cientists in Belgium who showed that is possible to produce a protein called nkephalin found in neurons and in erve endings by engineering the genes f plant seeds.

Enkephalin is an opiate-like chemical which plays the role of a natural pain-killer in the body. The scientists chose the neuropeptide called leu-enkephalin for the study because of its relatively small size and because its commercial availability made it possible to compare the two.

Using what is now a fairly standard practice among plant genetic engineers, the scientists chose the gene that codes for the protein and inserted it into the genetic structure of a plant bacterium called *agrobacterium tumefaciens*. This bacterium was then used to carry the gene into two plant species, *arabidopsis thaliana-thalecress*-and *brassica napus-rape* oilseed.

The seeds of both the transformed species produced the neuropeptide.

The scientists have estimated that if 3000 kilograms of brassica seeds are produced per hectare of the crop, at the production levels shown by the transformed plants, a hectare of brassica crop could yield between 15 and 75 grams of the neuropeptide.

Plants may thus represent an interesting alternative production method, particularly where large yields of longer peptides are required, they said. The ability of the seeds to store proteins stably for long periods of time enhance the flexibility of the technique, they said in their report in the journal 'Biotechnology'.

Last year a team of US scientists demonstrated the production of immunoglobulins and functional antibodies in transgenic tobacco plants. The scientists who reported their work in the British journal 'Nature' transformed tobacco plants using the agrobacterium and screened the leaf extracts from the regenerated transformants for the presence of immunoglobulins.

Earlier this year the biologists from Netherlands reported the successful production of human serum albumin in transgenic tobacco and potato plants. Albumin is a protein found in human blood produced by the liver. The researchers demonstrated the secretion of human serum albumin in leaf tissue and in suspension cultures.

This is not the first production of serum albumin through genetic engineering. Scientists have already demonstrated that some organisms like the bacteria *E coli* and *Bacillus subtilis* and *saccharomyces cerevisiae* can be suitably transformed to produce the protein. However, compared to the successful production of some smaller human proteins like insulin and the growth hormone and the infection fighting agent called interferon, it has been difficult to obtain useful levels of human serum albumin through these organisms.

The Dutch scientists said that more studies are needed to determine the possibility of producing the serum albumin at higher levels. Further optimisation of the expression levels to 1 to 2 per cent of tuber protein may be a realistic target, they said. With an average potato yield of some 50 tonnes per hectare in the Netherlands, the production of serum albumin could touch 12 kilograms per hectare. As the majority of the production costs would be covered through the concomitant production of starch, the process might become economically feasible, they said.

**P.T.I. Science Service,**
**July 16-31, 1990**

## STRUCTURAL CHANGES

Were it not for non-destructive techniques like infrared spectroscopy, the complex structure of organic compounds would remain out of the gamut of the laboratory. Realising the need for sophisticated and accurate infrared spectrophotometres, the Department of Science and Technology, along with the National Chemical Laboratory, Pune, kicked off a project to develop a 'grating monochromator infrared spectrophotometer'. Six years later, the NCL scientists have not only met the first mandate by developing the first indigenous spectrophotometer, they have updated the technology by linking it to a microprocessor. And the performance is gratifying. On seeing the new instrument, Bombay-based Blue Star, for example, immediately signed on the dotted line to manufacture 50 units of the spectrophotometer, with an expansion in capacity to follow. Even with Blue Star planning to tout the spectrophotometer for Rs. 2 lakh per unit, there is a tremendous potential for foreign exchange savings. for, the present annual demand of more than 200 such instruments was being met by imports. In the science lab, of course, the enhanced sophistication will cause an excitement of a different sort.

## NO SOUND BARRIERS

Diamonds might soon become the best friends a girl can never have if the pace of their commercial applications continues unabated. The latest is in the world of hi-fi music systems. Loud speakers in such systems are essentially based on a diaphragm which vibrates to create sound waves — the purity of sound is directly correlated to the rigidity of the diaphragm. Which is why a thin sheet of diamond was considered an ideal diaphragm, even though it was unachieveable. Now, the Japanese music giant Kenwood, in collaboration with Namaki Precision Jewel Company, claims to have not only developed, but also patented, a diamond diaphragm loudspeaker which reproduces frequencies twice as high as those produced by conventinal loudspeakers. The key claims, Kenwood, is a new vapour deposition process which helps in forming a film of pure diamond on the base of the diaphragm's dome at the rate of 100 micrometers (one millionth of a meter) per square cm per hour — 50 times faster then any previous method. In fact, a part of the reproduced sound from this dome diaphragm coated with a film of diamonds two micrometers thick, is beyong the range of human hearing, even while it enhances the quality of audible sound. But that should only excite hi-fi buffs.

---

## ACOUSTIC WATER LEVEL MONITORING SYSTEM

The Netherlands Institute of Applied Geoscience and the Institute of Applied Physics have developed an acoustic system to measure the groundwater level in wells.

Two earlier developments made it possible to implement the system. These are a transit time integrated circuit for echo acoustic applications and an inexpensive bar-code scanner developed for use in shops, reports "Applied Research".

The new measuring system will be commissioned in the near future. This system is based on an acoustic distance gauge, optimized for this particular application, linked to a data recorder. The distance gauge is based on an integrated circuit to measure transit times. The water level in the riser pipe is determined by accurately measuring the transit time of a short acoustic pulse which is reflected by the groundwater surface.

The distance between the top of the rise pipe and the water surface is then calculated using the transit time and the pulse speed. As the speed of sound depends on the temperature, the temperature is measured at the same time. The temperature is then included in the calculation of the distance. The results in a marked increase in the accuracy of the system.

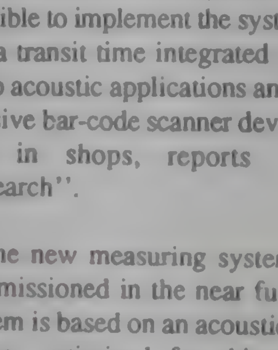
The riser pipes are identified by means of a bar-code scanner. Before measuring the groundwater level the observer draws the scanner across a bar-code attached to each riser pipe. The code is automatically read and verified after which the measurement is made automatically. The time at which the measurement was made is recorded together with the actual measurement.

The measured values are stored in a data recorder. At the end of the measuring period they can be transferred to a computer. The data can then be sent across the telephone network to a central groundwater database. The data recorder can store between 256 and 1000 measurements.

The new system has some major advantages over the system presently used, the measuring method is quick, accurate and reliable.

The identification system prevents mistakes when associating a measurementswith its location. The method also prevents errors due to manual measuring and data processing. Measurement can be made in a range of 0.2 m to 20 m with an accuracy of 1 cm. When greater depths are measured the accuracy is reduced to 2.5 cm.

**P.T.I. Science Service,**
**July 16-31, 1990**



GLASS DISTILLATION UNITS

20 lit to 200 Lit. ALL GLASS DIST. AND REACTION UNITS

WE MANUFACTURE

- HCL Absorbers Cascade Coolers Etc.
- Visible Flow Glass Pipeline Heat-Exchangers. Tee, Bends, Columns. Teflon Gasket, Metal Flanges, Etc. QVF Type upto 9"
- Quick Fit Type Interchangeable Laboratory Glass Appartus. Instruments and Appliances
- High Vacuum Gauges. Mercury Manometer & Switches.

LELE'S ALWAYS THE FIRST

★ In 1939 Late Dr. S.R. LELE World Known Glass Technologist Started M/s. I.E.A. to Manufacture Borosilicate Glass.
★ In 1963 This Co. was reformed as BOROSIL GLASS WORKS LTD. for making CORNING GLASS.
★ In 1969 he started SILICA WARE P. LTD. to Mfg. Custom made Glass Equipment.

UNIT NO. 2

92/B G.I.D.C. Nandesari Industrial Estate
NANDESARI Dist: BARODA. PHONE:-60383
Baroda City(O.) ■ 322382 ■ Resi 320187

SILICA WARE (P) LTD.,

54-C CHOTANI ESTATE, PROCTOR ROAD
GRANT ROAD, BOMBAY: 400 007.
PHONE: 357442 GRAM: LELESR
BOMBAY; MANIM

Representatives:-

■ HYDERABAD: Mr. VINAY KUMAR
Plot No. 7, P & T. Colony.
Behind R.R. Labs. HYDERABAD.
Telephone: 853821

■ MADRAS: Mr. K. VAIDYANATHAN
Flat No. 10/1 2nd. Loop Str.
Tamilnadu H.B. Colony.
Kotturpuram, MADRAS: 600 085.
Phone: 418758

PRINT-DESIGN

**INDIAN ORGANIC CHEMICALS LIMITED**

**LEADERS IN THE FIELD OF INDUSTRIAL CHEMICALS**

***NOW AVAILABLE***
HIGH QUALITY

**GLYOXAL 40%**

For Pharmaceutical and Textile
Auxiliary Manufacturers

ooo

**OUR RANGE OF PRODUCTS**

**Acid Group**

* Acetic Acid
* Acetic Anhydride
* Acetaldehyde

**Benzyl Products**

* Benzaldehyde
* Benzyl Acetate
* Benzyl Alcohol
* Benzyl Chloride

**Ester Solvents**

* Ethyl Acetate

**Plasticizers**

* DOP (Di-2-Ethyl Hexyl Phthalate)
* DBP (Di Butyl Phthalate)
* BBP (Benzyl Butyl Phthalate)
* DEP (Di Ethyl Phthalate)
* Other Phthalates

Manufactured by

**INDIAN ORGANIC CHEMICALS LIMITED**

Mehta Mahal, 15, Mathew Road,
BOMBAY - 400 004.
Gram: 'FUTURA' Bombay
Tel: 8111428-8112529-8113420
Telex: 011 - 75147 IOCL IN

AUTHORISED DISTRIBUTORS OF

**TRANSPEK INDUSTRY LTD**

FOR MAHARASHTRA
OF FOLLOWING PRODUCTS

**SODIUM HYDRO SULPHITE**
(All Grades & All Packing)

**SAFOLITE**
(Sodium Formaldehyde Sulphoxylate)

**SAFOLIN**
(Zinc Formaldehyde Sulphoxylate)

**SAFOLIN DS**

**RUBBER CHEMICALS**

**SULFATRAN**
(4,4'-Dithio Dimorpholine)

**CHLORO ACETYL CHLORIDE**
**98.5% to 99.1% Pure**

Actual Users & Dealers Contact:

**Rasendra Chemexport Pvt. Ltd.**

Pallanji's Baithi Chawl, Room No. 6,
Behind Sussex Indl. Estate,
Dadaji Kondadev 'X' Road, Byculla,
Bombay-400 027
Tel: 8720508, 8515993/4

ONE SOURCE FOR EVERY HIGH QUALITY
ENZYME

★ ENZYMES ★
Amyloglucosidase
Bacterial protease
Chymotrypsin
Fungal Amylase
Fungal Diastase
Lactase ★ Lysozyme
Malt Diastase
Pancreatin ★ Papain
Pectinase ★ Pepsin
Trypsin Chymotrypsin
Mixtures
Serra Peptidase

★ BIOCHEMICALS ★
● Bovine Albumin ● Haemoglobin Powder ● Heparin Sodium ● Lactobacillus Acidophilus

★ SPECIAL ENZYME ★
BLENDS
● Animal and Poultry Feed ● Bakery Application ● Leather Bating ● Protein Hydrolysis ● Textile Processing

Rathi
PAPAINS PVT. LTD.

dmn. Office : 105/106, Dhanlaxmi Ind. Estate,
pp. Golden Dyes, Old Agra Road, Thane
V)-400 601. Cable : PAPAINS Phones : 504011,
03445, 594705. FAX : (022) 2872811
ITY LIASON : 75-76-A, Mittal Court, Nariman
oint, Bombay-400 021. Phone : 244147, 244157,
049014 Telex : 112844 Cable : Taskforce
ombay)

E ALSO STOCK REFERENCE STANDARDS
FROM SIGMA & FIP COMMISSION

GRADATION

We Supply In Bulk & Small Packing At Most Competitive Prices

SULPHURIC ACID – 70%
(Textile Grade – For Carbonising)
SULPHURIC ACID – 96–98%
HYDROFLUORIC ACID – 60%
NITRIC ACID – 60 – 70 – 98%
ACETIC ACID – 70 – 98%
PHOSPHORIC ACID – 80 – 85%
HYDROCHLORIC ACID – 30 – 32%
OLEUM – 20%
LIQUOR AMMONIA
(Sp. Gr. 0.910 & 0.888)
FERROUS SULPHATE (Tech.)
in Commercial, C.P. and A.R. Grades

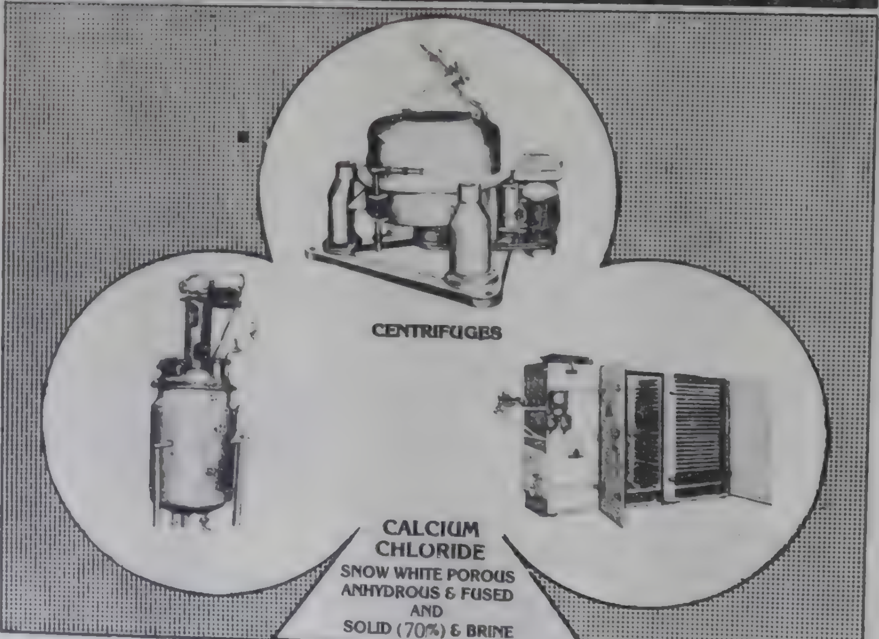
UNION ACID & CHEMICAL CO.

Head Office : 151-B, Mittal Court,
Nariman Point Post Box No. 11539,
Bombay - 400 021
Phones: 242325/4030/4075
224178/3222/5938

Branch Office
Agra Mahal, Agra Road,
Kurla Bombay 400 070
Phones : 5128464, 5128012

Telegram : *"UNIONACID"*

FOR A WINNING DEAL OF



ace
ACE INDUSTRIES
[illegible]

Adm. Office.
GALA NO. 14, ALPINE IND. ESTATE
MAROL MILITARY ROAD, ANDHERI (EAST)
BOMBAY - 400 059. PH. OFF.: 6365763
GRAM: MAKCHEMICS-Andheri (West) RESI: 6212378
Factory: J-718/2, G.I.D.C., 40 Shed, VAPI, Dist. Bulsar. Phone: 1494

# MATERIALS MANAGEMENT

## Part XVI — Packaging

N.R. PAI

### Packing and Packaging

There is a basic difference between the terms "packing" and "packaging". Technically speaking these two terms can be distinguished from each other. The term "packing" refers to preserving any material or product in a container with an aim to protect it. Thus soft drinks, liquors, hair-oil, talcum powder etc. are packed, preserved and protected in bottles or plastic containers of suitable sizes, shapes, and designs. Packaging on the other hand describes exterior container like crates, boxes etc. However, today "packaging" refers to entire area covered by the terms, "packing" as well as "packaging". It is therefore a broader term and covers inside and outside containers used for preservation and protection.

### Packaging — Material Manager's Responsibility

Materials Manager is concerned with the in-flow of purchased materials and the out-flow of finished goods. Both these operations involve transportation. It is material manager's ultimate responsibility to pack finished goods for disposal. He has to see that they are stencilled and/or labelled properly with transport instructions clearly written on the container, as also with the addresses of the customers. He has also to see that the packages are handed over in proper condition to the carrier.

As far as the supply of goods to his organisation is concerned, materials manager has to discuss with the supplier as regards the packaging of the goods which would suit him the most and with respect to the mode of transport of his preference and suitability. However, often it happens that the supplier has his own vehicle and then the product/s transported may not need special packaging. But in case transportation route is complex, then such packaging specification is needed so as to withstand all the hazards that accompany its complexity.

Normally packaging forms up to 20% of the final cost of product. It is especially so in case of high technology items, small consumer products and cosmetics. Looking to the expenditure over it, packaging must be evaluated from the point of view of benefit it serves. High investment in packaging is rarely worth going in for, and unneeded excessive spending over it should be avoided. Generally, cost/benefit analysis is brought into play here.

The whole aim of the management study boils down to cutting upon costs incurred, while maintaining the efficiency and quality of product or services. Value analysis technique is useful in this respect. We have already noted in our earlier communication, "Value Analysis" (Materials Management Part XIII, Chemical Weekly, dated 15.5.90) that it is the job of materials department. Hence it is the materials department that has to shoulder the responsibility of bringing down cost of packaging. Of course, it has to consult other departments like designing, production, marketing, finance and legal in this respect.

Today, technology is advancing by leaps and bounds in almost every field and packaging is not an exceptional area to it. Ingenious methods are devised in this province also to cut down upon packaging cost and yet to retain efficiency of service and thereby market. Thus, application of value analysis has brought into the field of packaging cheaper plastic packs in place of costly metallic ones. Nowadays, plastic strips replace metal foils for packaging medicinal tablets. Milk is packed and sold in paper or plastic containers.

### Factors involved in cost/benefit analysis

**Benefit factors**

1. Packaging protects the contents.
2. Packaging protects the surrounding material as well as the surrounding area. This aspect is more true in case of corrosive acids, poisonous goods (e.g. insecticides and pesticides in general), gas cylinders etc. Here any leakage can pollute or even destroy the surroundings.
3. Efficient packaging can contribute towards extending shelf-life of the product.
4. Containerisation (keeping small packages in a big container prior to their transport or shipment) minimises risk due to pilferage. It also reduces to bare minimum the damaging effects during selected transit which its contained packages may experience otherwise.
5. The second important purpose which the packaging has to serve is the marketing aspect. Packaging amounts to presentation. Attractive and well thought over packaging definitely helps in capturing the market and boosting the sales. It is especially so in the field of cosmetics where the customer is beauty-minded. Allured by the attractive design and presentation customer picks up the item. Next, he reads the literature given on the package which indicates purpose the item serves, how simple it is to use and how it can serve to his (customer's) exact needs. Thoughtfully designed packaging thus acts like an efficient salesman and the product becomes self-selling thereby reducing or otherwise nullifying the expenditure which the company would otherwise incur on employing an effective salesman or rather a salesperson. It is true in case of consumer packs.

Packaging presentation plays an important role in self-selling centers. It is a common or perhaps the only practice in advanced countries like USA, where man-power is costly.

Such countries are spending a lot over the point: "How to attract customers by effective packaging"? The question therefore arises "what makes a package attractive?" The answer lies in its convenient shape, size and portability as also in its alluring and colourful presentation.

Here, following example can be cited to substantiate the above statement:

One of the companies in USA was selling candy and fried products packed in plain white paper, with the product's and company's name printed on it in black letters. The new marketing manager changed the packaging technique. He had accepted the challenge of boosting the sales. He changed the wrapper in three coloured attractive design with the name of the product artistically written on it in colours and the result: The sales rose more than twice by this simple change in course of couple of months.

Much effort and money is spent in USA to asccertain (a) what attracts a customer in product packaging and (b) what is missing at present in a product packaging which if added would boost its sales.

Packaging designer carefully studies consumer reaction to the existing products of the kind, consumer's typical behaviour and his anticipated needs. Market study plays an important role here. Today, in our country especially space is a problem. If packs can occupy less space they will be warmly accepted by consumers. Compact designs are therefore very attractive for consumers.

Another point to be noted in this respect is: often the consumer tries to find out whether the container will be useful to him after its contents are exhausted by way of keeping some other product in it safely. This aspect does reflect in many consumer packs in the market today.

Packaging can help in materials handling operations. These operations can be eased and items can be handled with convenience just by altering the packaging shape and/or design. Excessive package size brings difficulty in handling and may demand special expensive equipment for its handling.

In general therefore, benefit aspect takes into account, degree of safety needed for the contents, value of the material packaged, package appearance, package presentation and message carried on packaging to aid in marketing the product and the reusability of packaging adopted.

**Cost Aspect**

It considers transportation cost as linked to the cost of packaging, cost of packaging material/s and that of packaging methods involved. Then there is a designing cost, cost of equipments used in packaging and expenses due to packaging operations.

**Packaging, transportation and packaging cost**

We have already seen in our earlier communication (Mate ials Management, Part XIV, Transportation and Physical Dis tribution, Chemical Weekly of 19th June 1990) that produc produced or manufactured has to be transported and conveye often several times before it reaches the final consumer. Pack aging plays a very important role here. There are severa modes of tranport and each one of them subjects materia conveyed to varying types of movement hazards like knocks shocks, vibrations, exposure to heat, cold and rains as also the excessive time of transit. Efficient packaging is therefore needed to reduce to absolute minimum in-transit hazards and damages. Packaging can certainly do the job of nullifying totally in-transit hazards and damages; but the cost incurred prevents its adoption. Cost/benefit analysis doubtlessly proves it to be absolutely impractical. Again, often excessive packaging which adds to the cost, bulk and weight of the packages may not be needed also. As in other areas of management here also the balance has to be struck between the cost of packaging and protection it affords to the contents. Hence, in practice, packaging selected should impart optimum degree of protection to the product during its storing, handling and especially while it is in transit and this should be achieved at the minimum cost. It should be noted that excessive packaging increases volumes of the goods transported. As a consequence there is a rise in weight and space requirements which in turn raises transportation cost.

Package design and expenditure over it is generally considered while keeping in mind the mode of transport to be adopted. Thus expensive modes of transport ask for light package material. One more point to be noted in favour of packaging is that it can augment strength of the packages which eases their stacking and improves their transportability. Since packaging and transportation both are costly many organisations are studying them elaborately these days to find out ingenious methods of bringing down their costs to the bare minimum. Today packaging is looked upon as an important means of ensuring safe delivery of products to the final consumer in an undamaged condition and that too with the least overall expenditure.

**Packaging Decision**

While designing packaging, type of product in hand should be considered. Costly shock-prone products like electronic calculators, tape recorders, binoculars, cameras, sensitive balances require shock-proof packaging. The reason being slight damage to their sensitive parts can render them unfit for use. Expensive and highly decomposable life-saving medicinals not only require well protective packaging but they demand quick mode of transport like air-lifting. While designing industrial packs no efforts and money need be spent in making them attractive. Advertising and making them alluring is not needed in their case. Thus for packaging to be effective and economical its requirements (i.e what purpose/s it s supposed to serve) should be clearly spelt out. It is for this reason that for adopting an ideal packaging, views of several departments (which include designing, production, marketing, traffic, finance and legal) should be taken into account. Then only packaging can become effective, safe and economical. It thus points out that systems approach (i.e. considering the organisation as a one single system) is the best way of handling this problem.

Finance departments views are needed as regards sanction of budget for packaging materials, as also for packaging equipment and for packaging operations. Validity of pack copy, trade mark etc., legal department has to look in to. Its green signal is needed before packaging design in finalised. Packages should not violate statutory rules as also the regulations agreed with the company undertaking transit responsibility. Production department looks into the type and extent of equipment or machine facilities needed for packaging operation. It can also give valuable advice with respect to the latest know how in this field. There are different production systems like job work, continuous and intermittent production etc. Whatever the system, production must synchronize well with packaging operations.

Traffic section of an organisation is better suited to ascertain which shortfall in packging leads to goods damage by studying the damage claims they come across during their routine work. This information can lead to valuable clues to bring down such damages and if the alternative is okayed. from the point of view of cost/benefit analysis it can be certainly implemented to the company's advantage.

### Package size and transport economy

It goes without saying that the packages should be in convenient shapes and sizes for conveyance as well as for consumer handling. Transport economy is one more critical factor to be looked into. The packages should be so designed that it occupies space in a carrier economically, leaving minimum needed vacant space in the carrier. This can be better implemented when the seller has his own vehicle. Here, it should be noted that some empty space is needed for movement of packages when it comes to customs or excise checking. With one's own vehicle, the packages can be so well designed and arranged that all the usable room in the carrier is fully utilised. This gives maximum benefit of cost saving per vehicle trip since trip efficiency gets boosted.

### Package cost saving by implementing automation

It has been observed that automatic machines play a significant role in bringing down packaging cost. The most common example is of pasteurised butter or cheese. Here the big blocks of the product are cut down into convenient pieces, which are then automatically wrapped in butter paper, packaged in cartons and then sealed by automatic devices.

Further examples in this field of automation are: automatic strip packaging of medicinal tablets and capsules, milk bottling and aerated water manufacture. In all these cases substantial saving and convenience of packaging is reported by adopting automation. This packaging procedure is much quicker too, as compared to manual handling. It thus helps in improving production.

### Export packagings

There are certain international norms and regulations that are laid down for export packagings. Any negligence in adhering to them and Air or Shipping organisations involved in their transit, emboss caustic remarks on Bill of Lading. Such remarks do come in the way of bank dealings.

### Packaging material in general use:

Glass in the form of carboys, jars, bottles etc. is very convenient for preserving chemicals in general and acids in particular (except hydrofluoric acid which attacks glass). The packing is further protected by shock absorbing material like straw or glass-wool placed between glass containers and outside wooden crates. Jute bags, polythene containers, aluminium foils as also sheets are often employed in packaging. Corrugated cardboards, foam rubber and thermocole side cuttings, are often used as shock absorbing materials. Steel hooks and tapes are commonly used in sealing.

From the point of view of shape, cube exhibits highest protective ability. Well-packed goods help in reducing expenditure on insuring them, since it better guarantees their safety. However, excessive expenditure on packaging may outweigh advantage one gets by way of declining insurance cost.

### Bar coding

This is a recent approach. The package usually carries the details to identify the material it contains. Sometimes contents are recognised by coded numerical. The recent-most approach is the introduction of graphic indicators that can be scanned by electronic devices. They go under the name UPC (Universal Product Codes).

They can be sensed by electronic reading device and can be interpreted to identify the contents, pricing etc. In advanced countries like USA such packages with their bar codes are displayed in supermarkets. "Coding" and "code sensing" hasten the process of billing and payment.

Thus customer's valuable time is saved which any customer would naturally appreciate. These coded identifiers are also called distribution codes or bar codes.

Available at Most Competitive Rates
from

a Trusted Name Since Two Decades

**NITRIC ACID**

**58%, 72% and 98%**
**in Tanker Loads Delivered All Over India**

**Chemicals & Allied Industries**

(Authorised Dealer of R.C.F. Ltd.)
215, Bezzola Complex, Sion-Trombay Road, Chembur, Bombay 400 071

Phones: 529693/523385
Gram: NITRICHEMI

---

Actual Users
AVAILABLE AGAINST YOUR IMPORT LICENCES THE FOLLOWING FROM OUR PRINCIPALS

**M/s. COALITE PRODUCTS LTD. U.K.**

AT MOST COMPETITIVE PRICES

**CRESYLIC ACIDS**
1. Various grades of Meta Para Cresol fractions
2. 2,4/2,5 Dimethyl Phenol Fractions
3. Various grades of Xylenol

**CHLORINATED PHENOLS**
1. Para Chloro Phenol
2. Ortho Chloro Phenol
3. 2,4-Dichloro Phenol
4. 2,4,6-Trichloro Phenol
5. Para Chloro Ortho Cresol

**DIHYDRIC PHENOLS**
1. Catechol 95%
2. Para Tertiary Butyl Catechol (TBC)
3. 3-Methyl Catechol
4. 4-Methyl Catechol
5. 2-Methyl Resorcinol

**BIOCIDES**
1. Ortho Phenyl Phenol
2. Sodium Ortho Phenyl Phenol
3. Mono Chloro Ortho Phenyl Phenol
4. Para Chloro Meta Xylenol

Please Contact:

**AMRITLAL CHEMAUX LIMITED**

Rang Udyan, Sitladevi Temple Road, Bombay 400 016.
Phone: 453251/461077/462655 Telex: 011-71514 AMCO IN Fax: (91) 22-458615

# New Products

## FLAME FAILURE MONITOR

IRA flame failure monitor is specially designed for igniting and monitoring flame in gas fired furnaces, boilers, flame screens, pilot flame in special atmosphere furnaces, flare stacks, kitchen equipment, etc.

It is direct monitor of flame through flame conduction, unaffected by heat, ambient light or soot from the flame. In multi-burner operations, individual burner failure can be monitored by IRA flame failure monitor by virture of its unique operating principle.

It consists of an electrode of high temperature material (which can withstand 1200 degrees C) and a control box consisting of power source, amplifier, trigger, circuit, etc. When the electrode is immersed in the flame, a small curent flows through the circuit. This is amplified and used to detect the flame.

As soon as power is given to the control unit, the ignition transformer and gas solenoid valve get energised after a waiting time of two seconds. The monitor watches the presence of flame. If the flame is detected, ignition transformer is put off and fuel line is kept on. In the event of flame being not detected for 5/7 seconds due to malfunction of the burner system, both the ignition transformer and fuel supply are put off and the controller goes into a lockout condition. Further ignition attempts can be made by pressing the reset button. In case of failure of flame during operation, the ignition transformer is energised automatically to initiate ignition.

If the flame is established and detected as in the earlier case, the ignition transformer is put off and fuel line is kept on. In the event of failure of flame ignition after a gap of five-seven seconds due to burner system malfunctioning both the ignition transformer and fuel supply are put off and the controller goes into a lockout condition.

For further information write to Industrial Research Associates, 62, Shah Industrial Estate, Behind Telecom Factory, Deonar, Bombay - 400 088.

## MOLECULAR DISTILLATION

Univac Products is in a position to undertake processing of customers' material in its centrifugal molecular distillation plant. Process parameters to give desired end-product can be developed with its deep understanding of the technique of molecular distillation.

High vacuum distillation using centrifugal molecular still is best suited for heat sensitive organic and silicone compounds in the molecular weight range of 150 to 4000. Normally, this distillation is carried out in a vacuum range of 1 to 20 microns. Because of the short exposure time to heat and lower temperature distillation, thermal hazard to the organic material is reduced by a factor of as high as 1,00,000.

This process is best suited for distillation of a host of materials like plasticizers, fatty acids, nitrogen compounds, polymerised fatty acids, highly concentrated pure fatty acids, esters, epoxy resins, vitamins, etc. This process can also be used to remove excess reactants, moisture of condensation, colour, odour and traces of catalyst.

For further details contact-Univac Products, 2/3, Rajmansion, 12th Cross, Swimming Pool Extension, Bangalore-560 003.

## NEW MEASUREMENT SYSTEM

A non-contacting ultrasonic system for level or volume measurement with application in steel, cement, fertilizer and oil industries, is now available in India through Larsen & Toubro Limited (L&T). Designated AiRanger XPL, the ultrasonic system is a product of Milltronics, Canada, represented in India by L&T. A single unit of the system monitors both bulk solids and liquids in ranges up to 61 metres in up to 10 vessels. The core of the system is a new ultrasonic technique, called Sonic Intelligence, which offers greater precision in level measurement, adapting continuously to all environmental variations in any vessel.

The basic system consists of a compact display unit with removable access programmer which can be located conveniently on the bin floor, as well as any of Milltronics LR or ST series transducers which may be placed up to 333 m distant. This easy-to-use system provides for continuous display of bin data and alarm indication through the main unit, or through a computer system via the computer interface.

Optional SAM-20 units for hardwired alarms and AO-10 analog output unit can be located where needed, up to 3000 m from the main electronics and connected by a single two conductor cable. In operation, the systems is self-adjusting, offering achievable accuracy of 0.25% with resolution of 0.1% of selected span.

For further details contact Larsen & Toubro Limited, (PID Division), Venkataramana Centre, 563, Anna Salai, Madras-600 018.

## CONTAMINATION MONITOR

Contamination levels of mineral oil in hydraulic systems can be measured quickly and easily, while equipment is still operating, with a portable monitor from Britain, (UCC International Ltd. System Monitoring Division), P.O. Box 3, Thetford, Norfolk, England IP24, 3RT). The CM 20, from UCC International is claimed to be the world's first inline contamination monitor. It is used in conjunction with the company's System 20 sensors, which are permanently installed anywhere within a fluid system. Once connected to the sensor, the instrument takes a 10 ml sample of oil, carries out the test and returns the sample to the system without any danger of spillage or ingress of contamination.The sample passes through the CM20 through a transparent slide system where any particles present have their area calculated and are counted by an optical scanning system. Every particle is viewed so that the result is a true measure of the content of the sample. During each four-minute test cycle, the microprocessor-controlled optical scanning system accurately measures the number of 5, 15, 25 and 50 μm particles per 100 millilitres. The result appears on a display, and a built-in 16 column printer can produce a permanent record, if required. The internal memory stores up to 300 results for later printout or downloading to a computer through an RS 232 interface.

Tests can be carried out inline with flow rates up to 400 litre/min and working pressures up to 400 bar. Accuracy and repeatability are claimed to be typically better than 5 per cent. The instrument is easy to use. All test operations are prompted by the display on the handheld readout unit. Power for up to 150 tests is provided by the built-in battery pack.

## BRIGHT ACID CHLORIDE ZINC PLATING PROCESS

Daulat International, Bombay who have successfully marketed "TINGLO" Bright Acid Tin Plating Process for the last two decades, have now introduced DIOZINC-BAZ, a Bright Acid Chloride Zinc Plating Process for Rack and Barrel. The DIOZINC-BAZ process plates fully bright, levelled and ductile zinc coatings from a cyanide free, chloride-based weak acid zinc solution. This process is more economical as compared to the cyanide process, easy to operate and is a potassium based ammonia-free process giving uniform brightness and levelling over wide current density range. Due to its high cathode efficiency (90-100%), it consumes less power as compared to cyanide process. It also accepts chromate treatments readily and easily plates cast iron, high carbon and hardened steels without inducing hydrogen embrittlement.

For further information, please conact: Daulat International, 167/1, A-Z Industrial Estate, Fergusson Road, Lower Parel, Bombay-400 013.

## SILICA IN VARIETY OF FORMS BY "BHAGWATI"

"Bhagwati" Ahmedabad offers wide range of Precipitated Silica in white granular, pellets and powder form having uniform particle size. PRE-SIL-300 is a unique result of intensive, pioneering efforts in R & D activities to meet growing demand. It fulfills a long felt need for an indigenous pelletised silica for the first time in India. It avoids dusting and handling losses during the charging of process. The company offers this product in different sizes, providing any desired softness to get high degree of dispersion and homogeneity for higher reinforcement, better tear stength, increased abrasion resistance and to reduce cutting & chafing of tyres.

Since its introduction, the above attractive form of silica of high stability, high purity, high or controlled surface area & dazzling white clarity has already carved out a special niche in automotive tyre industries both at home and abroad. Pellets — Granules have found increasing acceptance, among its customers.

"Bhagwati" also offers a powder form of silica that already has found a wide variety of applications such as automotive tyres, chappals, high performance belting, hawai chapples, dockside fenders, insecticides, paints, ink, cable cover sheaths, tooth paste, plastic etc., which will help to achieve pe formance to the international standard

For details please write to: M/ Bhagwati Silica (P) Ltd., "Gayat Kutir", C-17/18, GIDC Flats, Naroda Ahmedabad. Phone: 81 27 11/81 35 36

## NATURAL FOOD COLOURS

Aarkay Food Products Pvt. Ltd., is an upcoming name in natural food colours It has already established a good reputation as suppliers of caramel colours annatto natural yellow butter colour and annatto water soluble cheese colour. Aarkay with its limited R & D facility have been able to produce acid fast natural colours for the first time in India. These include annatto water soluble natural yellow acid fast colour —for soft drinks, dairy industries, food industries, confectionaries etc. Aarkay have been able to develop and standardize the extraction process for manufacture of natural range of acid proof colours working at different pH ranges from the vegetables abundantly available in India, and will be shortly introducing the same in the market. The products are expected to compete in the market with synthetic colours with regards to cost, quality and availability.

For further enquiries contact: Aarkay Food Products Pvt. Ltd., 314, Gurunanak Market, Panchkuva, Ahmedabad-2. Phone: 400 829, 384 595.

## CALCIUM BATTERY OFFERS HIGH POWER WITHOUT DANGER

A new calcium high power density battery prototype developed at Tel Aviv University overcomes the explosion hazards presented by lithium batteries currently in use. The new calcium battery has a shelf life of three years and an operating temperature ranging from minus 40 to plus 200 degrees C. Because it resists charging and reversal abuse, no diode protection is needed, and it can safely be transported by air.

## RACTION COLLECTOR SUIT-BLE FOR SMALL SAMPLES

The ability to collect small fractions or high-performance liquid-hromatography systems makes a colector from Britain particularly suitable or use by biochemists and molecular iolgists.

The 5512 fraction collector, from aytee Biosciences, is simple to operte and yet provides advance features so hat it can cope with handling all colection requirements. Carousels, which an be changed in seconds, are availble in a wide range to carry glass-fibre liscs, 1.5 ml tubes or larger test tubes. Special carousel types, with capacities of 4 to 80 vials, can be supplied to order.

Various operating modes on the fracion collector allow the carousel to be controlled from front panel, or from external equipment, to be moved at timed intervals, which can range from two seconds to more than 99 minutes in one-second increments. Peak concentrations can be collected using built-in peak detection software. Carousel movement is controlled to find the shortest route between vials, with time between cups being less than 0.5 s for a 60-cup carousel. Full manual control of the 5512 is effected by means of six buttons which are used in conjunction with a four-digit display and illuminated symbols.

Absence of complex key sequences means that users can become familiar with the operation of the fraction collector in minutes, according to the company.

External controls allow the 5512 fraction collector to function as a standalone unit or to form an integral part of a chromatograph through the industry-standard RS232C serial interface to a laboratory computer or PC.

For further details contact, Jaytee Biosciences Ltd., Kent R & D Centre, University of Kent, Canterbury, Kent, England CT2 7PD. Company contact: Mr. M. Stevenson. Telephone: 44 227 375253; Fax: 44 227 365104).

This fraction collector is an analytical tool required to collect fractions from high-performance liquid chromatography. It has been designed by a British company and its ability to collect very small samples makes it particularly suitable for use by biochemists and molecular biologists.

## ACCURATE AND RELIABLE TEMPERATURE MEASUREMENT-THE KEY TO BETTER ECONOMICS

Leading companies in the plastics processing, packing, chemical and apparatus construction fields know quite well that absolutely reliable temperature sensors and control systems are the key to low reject rates and long service (tool) life.

The high-tech temperature sensor SW155 from Sawi — successfully employed for more than a million applications

Sawi, Winterthur (Switzerland), also recognized this fact at a very early stage and has been supplying its own specific developments for applications fo this kind for more than twenty-five years. The wide product spectrum has enabled the company to gain a leading position in the market. The jacket-type thermocouple SW155 may be quoted as an example. This mineral insulated high-tech sensor is characterized by its extemely fast actuation time. The length of the feeler and the diameter of the Fe-CuNi or NiCr-Ni thermocouple (designed according to DIN-IEC 584) can be selected from a wide range of existing models. Delivery is effected at short notice. This measurement sensor has been successfully employed for over a million applications, e.g. in the nozzles of injection moulders or in packing machines for foodstuffs.

The latest development from Sawi is a titanium nitride-coated temperature sensor for direct mass measurement. The service life of this instrument exceeds those of conventional types by far. It will be on show to the trade at the Fakuma '90 in Friedrichshafen (Federal Republic of Germany).

## NEW MULTI-MILL

Sigma Engineeing, White Plains NY, has announced a new multi-purpose colloid mill with a cooled rotor in addition to a cooled stator. The patented cooled rotor and stator combination of the MULTIMILL makes for much lower heat build-up of the material being milled.

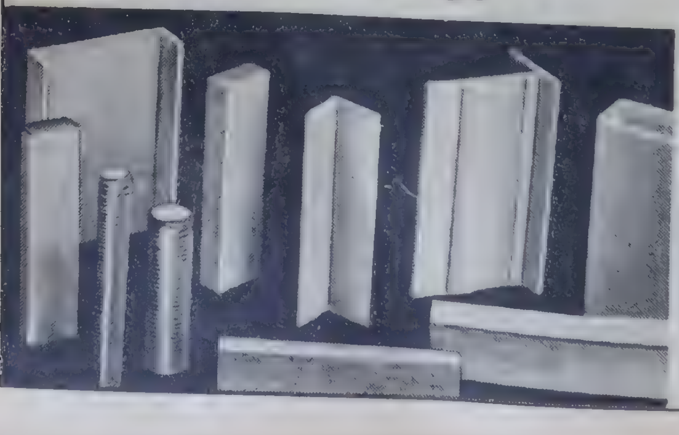
In addition, the machine can be fitted with a special eductor system to immediately disperse powders into liquids. The resultant slurry is then passed through the grinding zone of the mill for particle reduction and homogenization. Xanthan Gums, Carbomers, pigments and many other products are easily handled.

For more information contact Sigma Engineering, Inc., 39, Westmoreland Avenue, White Plains NY 10606, Fax: (914) 682-0599, Tel: 682-1820 Tlx: 4941374 SIGMACO.

## BIODEGRADABLE PLASTIC

Heinz of the US has come out with a new plastic ketchup bottle specifically designed for the recycling market. The new plastic bottle contains 98.5% polyethylene terephthalate (PET). The remaining 1.5% is an oxygen-barrier material, which makes it safe for highly-sensitive foods like tomato products. Heinz hopes the bottle will be as useful to recycling mills as pure PET. The bottles are expected to hit the market some time next year.

Scaling new heights in fibreglass application technology



GET XTRUGLAS
pultruded FRP profiles

XTRUGLAS.
High performance thermosetting resins, with fibreglass reinforcements give it extraordinary corrosion resistance. And an unmatched versatility in application.
The exceptional pultrusion process gives Xtruglas diamensional stability and ensures it is void free.
Brought to you by SSB Industries Ltd – Associate Company of the WS Industries group, a leader in insulating materials technology.

XTRUGLAS OFFERS:
- Total machinability
- Non-skid surface
- High di-electric strength
- Little or no maintenance
- Superior strength-to-weight ratio.

So, for all your chemical, civil or mechanical applications call us. We'll design and offer a tailor-made solution.

SSB

*Committed to excellence through innovation*
SSB INDUSTRIES LTD.
Electrical Products Divn., 27th KM, Bellary Road,
Settigere Village, Bangalore – 562 157
Ph.: Yelahanka 70 Chickajala 30
Telex: 0845-8716 Grams: 'MICABUSH

# Indian Standards

(Continued from the previous issue)

3537:1966 Ready mixed paints, finishing, interior for general purposes, of Indian Standard Colours, No. 101, 216, 217, 219, 275, 281, 352, 353, 358 to 361, 363, 364, 388, 410, 442, 444, 628, 631, 632, 634, 693, 697, white and black (Amendment No. 1).

S 3538:1966 Ready mixed paints, red oxide barium chromate/barium potassium chromate primer (withdrawn).

S 3539:1966 Ready mixed paint, undercoating, for use under oil finishes, to Indian Standard Colours, as required (Amendment No. 3, November 1988).

S 3550:1965 Methods of test for routine control for water used in industry.

S 3551:1966 Pure nitrogen (dry).

S 3562:1965 p-nitrotoluene, technical.

S 3588:1966 Ready mixed paint, aluminium brushing priming, water resistant, for woodwork (Amendment No. 1).

S 3605:1984 Bauxite for chemicals and petroleum industries (first revision).

S 3607:1979 Magnesite for chemical industry (first revision).

S 3827:1966 Riboflavin (Lactoflavin) (with Amendment No. 1).

S 3839:1966 Food yeast (first revision).

S 3841:1966 ß-Carotene (with Amendment No. 1).

S 3858:1981 Benzyl acetate (first revision).

S 3898:1981 Zineb, technical (first revision) (with Amendment No. 1).

S 3899:1981 Zineb water dispersible powders (first revision) (with Amendment No. 1).

S 3900:1975 Ziram technical (first revision).

S 3901:1975 Ziram water dispersible powder (first revision) (with Amendment No. 1).

S 3902:1975 Dimethoate technical (first revision) (with-Amendment No. 1).

IS 3903:1984 Dimethoate emulsifiable concentrates (secondrevision) (with Amendment No. 1).

IS 3904:1966 Thiometon concentrates (with Amendment No.1).

IS 3905:1966 Thiometon emulsifiable concentrates (with-Amendment No. 1, 2, 3 and 4).

IS 3924:1980 Benzyl alcohol (first revision).

IS 3925:1980 Eugenol (first revision).

IS 3926:1986 Methyl cinnamate.

IS 3927:1986 Iso-butyl phenyl acetate.

IS 3928:1986 Styralyl acetate (first revision).

IS 3929:1984 Amyl salicylate (first revision).

IS 3958:1984 Methods of sampling cosmetics (first revision).

IS 3986:1988 Sodium lauryl sulphate for cosmetic industry(-third revision).

IS 3987:1983 Sorbitol solution (70 percent) (second revision).

IS 3988:1981 Guar gum (first revision).

IS 4015 (Part 1):1987 Guide for handling cases of pesticides poisoning Part 1 & Part 2)

IS 4016:1966 Density composition tables for aqueous solutions of sodium hydroxide.

IS 4023:1966 Methods for thedetermination of reactivity of coke.

IS 4028:1982 Beeswax, bleached for cosmetic industry(second revision).

IS 4117:1973 Alcohol denaturants (first revision) (with-mendment No. 1).

IS 4150:1984 Potassium chloride, technical (second revision).

IS 4173:1975 4-methyl aminophenol sulphate (first revision) (Amendment No. 1 of 1982).

IS 4200:1984 Sodium aluminate (first revision).

IS 4209:1987 Code of safety for chemical laboratories (first (revision).

IS 4236:1985 Glyceryl monostearate for cosmetic industry (second revision).

IS 4256:1967 Hydrated calcium sulphate from marine brine (Amendment No. 1).

IS 4262:1967 Code of safety for sulphuric acid.

IS 4263:1967 Code of safety for chlorine.

IS 4264:1967 Code of safety for caustic soda.

IS 4265:1965 4,4'- Diaminostilbene-2.2'—Disulphonic acid (first revision).

IS 4273:1984 Iso-bornyl acetate (first revision).

IS 4306:1987 Hexamethylene tetramine (hexamine) (secondrevision) (with Amendment No. 1 Jan. 1990).

IS 4334:1985 2-Chloroaniline.

IS 4335:1985 3-Chloroaniline.

IS 4336:1985 4-Chloroaniline.

IS 4344:1978 Endosulfan, technical (first revision).

IS 4345:1967 Binapacril technical.

IS 4408:1979 Sodiumchloride, analytical reagent (first revision).

IS 4425:1967 p-Nitrotoluene-o-sulphonic acid (with Amendment No. 1).

IS 4446:(Part 1):1986 Chlorophyll Part 1 & 2.

IS 4447:1967 Sodium benzoate, food grade (with Amendment No. 1).

IS 4448:1967 Benzoic acid, food grade.

IS 4451:1967 Toxaphene, technical (with Amendment No. 1 and 2).

IS 4505:1968 Sodium formaldehyde sulphoxylate (Amendment No. 2).

IS 4544:1968 Code of safety for ammonia (Amendment No. 1, Sep. 1979).

IS 4560:1968 Code of safety for nitric acid.

IS 4566:1979 Methylene chloride (dichloromethane), technical (first revision).

IS 4581:1978 Phosphorus trichloride, pure and analytical reagent (first revision).

IS 4603:1968 Phenyl ethyl alcohol.

IS 4611:1973 Metallic zinc powder (zinc dust) (first revision)(with Amendment No. 1).

IS 4644:1968 Code of safety for benzene, toluene and xylene.

IS 4652:1987 Ethyl p-hydroxybenzoate for cosmetic industry (second revision).

IS 4653:1985 Methyl p-hydroxybenzoate for cosmetic industry (second revision).

IS 4654:1974 Specification for paraffin wax (first revision) (with Amendment No. 1, 2, 3 and 4).

IS 4668:1985 Ammonium nitrate for explosives (first revision) (Amendment No. 1 of 1989).

IS 4669:1968 Methods of test for polyvinyl chloride resins(with Amendment No. 1).

IS 4737:1982 Chromite for chemical industries (first revision).

IS 4751:1968 Potassium metabisulphite, food grade.

IS 4752:1968 Sodium metabisulphite, food grade.

IS 4753:1968 Potassium nitrate, food grade (with Amendment No. 1).

IS 4764:1973 Tolerance limits for sewage effluents discharged into inland surface waters (first revision).

IS 4766:1982 Thiram water dispersible powder (first revision)(with Amendment No. 1).

IS 4783:1982 Thiram seed dressing formulations (first revision) (with Amendment No. 1).

IS 4808:1982 Pyrethrum emulsifiable concentrates (first revision) (with Amendment No. 1).

IS 4830:1979 Ammonium phosphate sulphate, granular (first revision).

IS 4846:1968 Sodium potassium tartrate (Rochelle salt).

IS 4847:1979 Copper salts for electroplating (first revision).

IS 4887:1980 Petroleum jelly for cosmetic industry (first revision).

IS 4929:1978 Dichlorvos, technical (first revision) (with Amendment No. 1).

IS 4958:1968 Phosphamidon, technical.

IS 5003:1968 Cadmium oxide for electroplating.

IS 5025:1985 Gum Karaya (second revision).

IS 5042:1976 1-Aminoanthraquinone (first revision) (with Amendment No. 1).

IS 5043:1976 2-Aminoanthraquinone (first revision).

IS 5044:1969 Benzanthrone (with Amendment No. 1).

IS 5045:1976 Metanilic acid, technical (first revision).

IS 5055:1969 Lecithin, food grade (with Amendment No. 1).

IS 5057:1969 Potassium nitrite, food grade.

IS 5058:1969 Sodium citrate, food grade.

IS 5149:1977 Maleic anhydride, technical (first revision).

IS 5158:1987 Phthalic anhydride, technical (second revision).

IS 5182:(Part 1):1969 Methods for measurement of air pollution (Part 1 to Part 20).

IS 5183:1977 Guide for treatment of effluents of tannin industry (first revision).

IS 5184:1969 Code of safety for hydrofluoric acid.

IS 5191:1969 Sodium alginate, food grade (with Amendment No. 1).

IS 5208:1969 Code of safety for acetic acid.

IS 5210:1969 High impact polystyrene sheet (with Amendment No. 1).

IS 5254:1980 Acetanilide (first revision).

IS 5271:1984 Paraformaldehyde (first revision).

IS 5277:1978 Dichlorvos emulsifiable concentrates (first revision) with amendment No.1).

IS 5278:1969 Dicofol, technical.

IS 5279:1969 Dicofol emulsifiable concentrates.

IS 5280:1969 Fenitrothion, technical (with amendment No.1).

IS 5281:1979 Fenitrothion, emulsifiable concentrates (firstrevision).

IS 5288:1980 Barium chloride (first revision).

IS 5295:1985 Ethylene glycol (first revision).

IS 5296:1979 Chloroform, pure and technical (first revision).

IS 5297:1977 Perchloroethylene (tetrachloroethylene), technical (first revision) (with Amendment No.1, Nov. 86).

IS 5301:1987 Sodium chlorate (first revision).

IS 5302:1969 Code of safety for acetic anhydride.

IS 5305:1969 Method for volumetric determination of phosphorus.

IS 5306:1978 Sodium carboxymethyl cellulose, food grade first revision)(with amendment No.1).

IS 5311:1969 Code of safety for carbon tetrachloride.

IS 5316:1969 Ammonium carbonate.

IS 5321:1969 Soda lime (as carbon dioxide absorbent) (Amendment No.2.).

IS 5340:1981 Lanolin, anhydrous for cosmetic industry (first revision).

IS 5341:1980 Benzyl chloride, technical (first revision)(with Amendment No.1, Mar. 83).

IS 5342:1969 Ascorbic acid, food grade.

IS 5343:1969 Butylated hydroxyanisole, food grade.

IS 5344:1969 Butylated hydroxytoluene, food grade (withdrawn).

IS 5345:1978 Sodium saccharin, food grade (first revision).

IS 5356:1983 Iso-propyl myristate for cosmetic industry (second revision).

IS 5379:1969 Ammonium thiosulphate, photographic grade (Amendment No. 1 of 1986).

IS 5380:1976 Sodium bromide, photographic grade (first revision).

IS 5398:1969 Methods for estimation of thiamine (vitamin B-1) in foodstuffs.

IS 5399:1969 Methods for estimation of riboflavine (vitamin B-2) in foodstuffs.

IS 5400:1969 Methods for estimation of nicotinic acid (Niacin) in foodstuffs.

5406:1979 Urea, fertilizer grade (first revision).
5438:1977 Nitrobenzene-3-sulphonic acid, sodium salt first revision).
5464:1970 Citric acid, monohydrate (under review).
5470:1969 Dicalcium phosphate, animal feed grade.
5526:1969 Coumafuryl, technical.
5549:1970 Warfarin bait concentrates (with Amendment No. 1, 2 and 3).
5551:1970 Warfarin sodium, technical.
5552:1970 Warfarin technical.
5573:1984 Ethylene oxide (first revision).
5591:1969 Chlorobenzene.
S 5592:1981 Monochloroacetic acid (first revision).
S 5646:1970 p-Anisidine (with Amendment No. 1).
S 5647:1970 p-Toluidine.
S 5648:1970 o-Anisidine (with Amendment No. 1).
S 5649:1983 2-Toluidine (first revision).
S 5667:1970 Thinner for cellulose nitrate based paints and lacquers (Amendment No. 1, February 1979).
S 5670:1984 Lead thiocyanate for explosive and pyrotechnic compositions (first revision).
S 5671:1984 Strontium nitrate for pyrotechnic compositions (first revision).
S 5685:1970 Code of safety for carbon disulphide (Amendment No. 1, March 1972).
S 5707:1970 Agar, food grade.
S 5708:1970 Sodium tartrate, food grade.
S 5709:1978 Calcium saccharin, food grade.
S 5713:1981 Manganese dioxide for explosive and pyrotechnic compositions (first revision).
S 5719:1970 Gelatin, food grade.
S 5731:1970 Antimony sulphide for explosive and pyrotechnic compositions.
S 5752:1970 Yara yara.
S 5753:1982 Amyl cinnamic aldehyde (first revision).
S 5754:1988 Phenyl acetic acid (first revision).
S 5757:1971 Pine oil (first revision).
S 5785:(Part 1):1970 Methods for performance tests for surface active agents: Part 1 to Part 5.
S 5863:1985 Methods for determination of malathion residues in food commodities (first revision).
IS 5864:1983 Methods for determination of DDT residues in food commodities (first revision).
IS 5877:1971 Barium sulphide, technical (black ash).
IS 5949:1980 Methods for volumetric determination of calcium and magnesium using EDTA.
IS 5952:1970 Methods test for the estimation of parathion residues.
IS 5985:1985 Code of practice for handling and storage of bagged fertilizers (first revision).
IS 6015:1970 Barium hydroxide (first revision).
IS 6029:1977 Green S, food grade (first revision).
IS 6030:1971 Sodium propionate, food grade.
IS 6031:1971 Calcium propionate, food grade (with Amendment No. 1).
IS 6092:(Part 1):1985 Methods of sampling and test for fertilizers (Part 1 to Part 6) Sampling (first revision).
IS 6100:1984 Sodium tripolyphosphate, anhydrous, technical (first revision) (Amendment No. 1).
IS 6135:1981 Soda ash, fused, technical (first revision) (Amendment No. 1).
IS 6155:1987 Sodium carbonate, monohydrate, photographic grade (first revision).
IS 6156:1971 Code of safety for chlorosulphonic acid.
IS 6164:1971 Code of safety for hydrochloric acid.
IS 6169:1983 Methods for determination of BHC residue in food commodities (first revision).
IS 6177:1981 Phosphamidon water soluble concentrates (first revision).
IS 6178:1982 Pyrethrum dusting powders (first revision).
IS 6186:1986 Bentonite (second revision).
IS 6258:1971 o-Nitroanisole.
IS 6259:1971 Anthraquinone, technical (with Amendment No. 1).
IS 6260:1971 p-Nitroanisole.
IS 6264:1971 J-acid (with Amendment No. 1).
IS 6265:1971 Quinizarine, technical.
IS 6266:1983 1,4-diaminoanthraquinone technical.
IS 6267:1971 Silver cyanide and silver potassium cyanide for electroplating (with Amendment No. 1, Feb. 1985).
IS 6269:1971 Code of safety for ethylene oxide.
IS 6270:1971 Code of safety for phenol.
IS 6301:1971 Basic chromium sulphate (for tanning).
IS 6333:1985 Propyl p-hydroxybenzoate for cosmetic industry (second revision).
IS 6334:1987 Butyl p-hydroxybenzoate for cosmetic industry (second revision).
IS 6358:1971 Potassium and sodium cyanides for electroplating (Amendment No. 1, May 1979).
IS 6361:1971 Methods of chlorimetric determination of phosphorus.
IS 6367:1971 Dextrin for adhesive industry.
IS 6385:1978 Saccharin, food grade (first revision) (with amendment No. 1)
IS 6386:1971 Beta-apo-8 carotenal, food grade.
IS 6393:1987 Alpha-Phenylacetamide (first revision).
IS 6405:1971 Canthaxanthine, food grade.
IS 6406:1977 Brilliant blue, FCF, food grade (first revision)(with Amendment No. 1).
IS 6412:1971 Benzoyl chloride, technical.
IS 6429:1981 Heptachlor dusting powders (first revision).
IS 6432:1972 Heptachlor, technical.
IS 6438:1980 Aluminium phosphide formulation (first revision) (with Amendment No. 1 and 2).
IS 6439:1978 Heptachlor emulsifiable concentrates (first revision) (with Amendment No. 1 and 2).
IS 6444:1979 Sulphur dusting powder (first revision).
IS 6448:1980 Diammonium phosphate (first revision).

IS 6496:1972 Precipitated calcium silicate pigments for paints Amendment No. 1, Feb .1988).
IS 6507:1982 Sodium chromate, technical (first revision).
IS 6515:1972 Sodium pentachlorophenate, technical.
IS 6605:1972 Potassium chromate.
IS 6614:1972 Aluminium chloride, anhydrous, technical.
IS 6627:1980 Dimethyl phthalate plasticizer (first revision).
IS 6646:1972 Oil of turpentine, solvent grade.
IS 6655:1972 Methods of test for sulphur (amendment No.1).
IS 6661:1972 Potassium schoenite.
IS 6678:1972 Ammonium thiosulphate solution photographic grade (amendment No.1 of 1988).
IS 6712:1972 o-Dichlorobenzene.
IS 6716:1981 Benzoic acid, technical (first revision) (with amendment No.1 Jan.1985).
IS 6718:1972 Phenoxyacetic acid.
IS 6749:1972 Glossary of terms relating to alcohol (ethyl industry and trade).
IS 6768:1973 m-Aminophenol.
IS 6770:1984 Benzophenone (first revision).
IS 6775:1973 Ethyl chloride, technical.
IS 6793:1972 Fumaric acid, food grade (with amendment No.1 & 2).
IS 6794:1972 Dodecyl gallate, food grade.
IS 6795:1972 Accacia (Arabic) gum, food grade.
IS 6796:1972 Propyl gallate, food grade.
IS 6797:1972 Methyl ester of beta-apo-8 carotenoic acid.
IS 6798:1972 Octyl gallate, food grade.
IS 6818:1973 Code of safety for phosphoric acid.
IS 6819:1973 Code of safety for calcium carbide.
IS 6831:1982 Caustic potash, technical and analytical (first revision).
IS 6897:1973 Methods of test for tannic acid.
IS 6898:1973 Methods of test for gallic acid.
IS 6940:1982 Methods of test for pesticides and their formulations (first revision) (with amendment No.1).
IS 6947: (Part 1); 1973 Part 1. Estimation of lead, zinc oxide titanium dioxide, calcium compounds and zinc sulphide (amendments No.1, June 1975).
IS 6961:1984 3-Bromobenzanthrone, technical (first revision).
IS 6962:1973 3, 9-Dibromobenzanthrone, technical (under revision).
IS 6971:1973 2-Ethyl hexane-1-ol.
IS 6972:1973 Benzotrichloride, technical.
IS 6977:1973 1, 5-Diaminoanthraquinone, technical.
IS 6980:1983 Tetrasodium pyrophosphate, anhydrous, technical (first revision).
IS 7038:1973 Chloroplatinic acid (platinum chloride).
IS 7121:1973 Carbaryl water dispersible powder concentrate (with amendment No.1, 2 & 3).
IS 7122:1984 Carbaryl dusting powders (first revision).
IS 7126:1973 Fenitrothion dusting powders.
IS 7127:1973 Tryptone, microbiological grade.
IS 7129:1973 Potassium carbonate, anhydrous (Amendme No. 2).
IS 7130:1985 Chlorosulphonic acid, technical (first revisio
IS 7131:1973 Nitrophosphate based granulated fertilizer
IS 7134:1973 Diphenol (with Amendment No. 1).
IS 7135:1987 Dimethyl sulphate, technical (first revision
IS 7158:1973 Isobornyl thiocyanoacetate (thanite) technic (with amendment No. 1).
IS 7163:1973 Potassium iodide, pure and analytical reage (first revision).
IS 7168:1973 Warfarin sodium salt water soluble powd (with amendment No.1)
IS 7220:1974 Ethylenediaminetetra-acetic-acid, pure a technical.
IS 7223:1986 Potassium chloride, analytical reagent (fir revision).
IS 7233:1985 2, 4-D Ethyl ester (first revision).
IS 7238:1974 Tragacanth gum, food grade.
IS 7239:1974 Gum gatti, food grade.
IS 7260:1974 Ethyl ester beta-apo-8 'carotenoic acid' foo grade.
IS 7278:1974 Methyl chloride.
IS 7359:1974 1-Chloroanthraquinone, technical (under rev sion).
IS 7360:1974 1, 5-Dichloroanthraquinone, technical.
IS 7362:1986 Tobias acid (first revision).
IS 7364:1986 3-Nitro-4-Aminotoluene (first revision).
IS 7395:1974 Gum ghatti.
IS 7415:1974 Code of safety for aniline.
IS 7420:1974 Code of safety for phthalic anhydride.
IS 7444:1974 Code of safety for methanol.
IS 7445:1974 Code of safety for acetone.
IS 7450:1974 Vulcanized styrene butadiene rubber (SBR based compound.
IS 7498:1985 Methods of sampling and test for carbon blac (first revision).
IS 7539:1975 Carbaryl technical (with amendment No. 1
IS 7541:1974 Stabilized liquid sulphur trioxide.
IS 7559:1974 Salicylic acid, technical (under review).
IS 7602:1975 Lead chromate for explosive and pyrotechni compositions.
IS 7618:1974 Hexachloroethane.
IS 7619:1987 Pentaerythritol (first revision)
IS 7633:1982 Calcium carbonate for explosive and pyrotech nic industry (first revision).
IS 7635:1975 2-Nitroaniline.
IS 7636:1975 4-Chloro-2-toluidine.
IS 7637:1975 5-Chloro-2-toluidine.
IS 7641:1975 4-Chloro-2-anisidine (under review).
IS 7642:1975 4-Aminophenol (with Amendment No. 1).
IS 7643:1975 4-Chloro-o-Nitroaniline.
IS 7644:1975 3-Nitroaniline (under review).
IS 7645:1975 Phenyl J-acid, technical (under review).
IS 7646:1975 Benzoyl J-acid, technical (under review).

# News From Japan

## GLOBAL DEMAND FOR PAN CARBON FIBER SEEN TOPPING 10,000 T

Toho Rayon Co. recently announced figures covering global demand for PAN-type carbon fiber in 1989 and projections on it covering from 1990 thru 1992. Related data were gathered from its business partners including BSM (U.S.) and Akzo (Netherlands).

According to the company, global demand for the product in 1989 amounted to 6,310 tons, showing a robust increase of 15% over the preceding year. It was much larger than the original estimate (5,600 t) worked out at the end of 1988.

Growth rates by area were: the United States, 15.1%; Europe, 13.3%; Japan, 5.7% and others (S. Korea and Taiwan, etc.), 23.6%. Demand for use in tennis rackets and golf-club shafts was markedly brisk in S. Korea and Taiwan.

Looking at combined demand by application, it breaks down into: aircraft/aerospace, 2,660 tons (share: 42%); sports/leisure goods, 2,390 tons (38%) and industrial purposes, 1,260 tons (20%).

The States accounts for more than 90% of application of the product to aircraft/aerospace, while more than 90% of demand for use in sports/leisure goods comes from S. Korea and Taiwan.

The company forecasts that the said demand will attain high annual growth of 16-17% from 1990 thru 1992: It is expected to reach 10,000 tons in 1992.

Behind the optimistic estimate are moves toward building up carbon fiber plants throughout the world and forecasts that brisk demand will continue for use in aircraft in the U.S. and for use in sports/leisure goods in S. Korea and Taiwan.

## HITACHI ZOSEN TO BUILD UP ANTIPOLLUTION BUSINESS

Hitachi Zosen Corp. envisages adding equipment for disposal of flue gas and industrial waste to its product line of pollution-control equipment including an urban garbage incinerator as mainstay item. The company also plans to consolidate marketing/technical tie-ups with Akata Construction & Engineering Co. acting as a supplier of water-treatment equipment.

It intends to win 60 billion yen's worth of orders for antipollution equipment this fiscal year; the target figure is 30% more than the preceding year's level.

The company technically tied up with Von Roll Ltd. (Switzerland) in 1960 and began to receive orders for a garbage incinerator based on the Swiss firm's technology. It has now become Japan's leading manufacturer of waste incinerators with their orders reaching Yen33 billion in fiscal 1989.

The company considers flue-gas treatment equipment for garbage incinerators to have considerable commercial potentialities: related technology has been imported from LAB (Italy) in co-operation with Marubeni Corp. The equipment is capable of simultaneously treating dust, hydrogen chloride, sulfur oxides and heavy metal-all contained in flue gas-using a wet-type process.

It calls for only one-third of the installation space needed for conventional equipment.

The company expects use of desulfurization/denitration technology and technology for simultaneously removing mercury and NOx from flue gas through combined use of sodium hypochloride and bromine to further spread throughout the world.

In addition, it has also placed high hopes on marketing of pulverizing/solidifying/recycling equipment for industrial waste.

## COSMO OIL TO INTENSIFY ALKALINE DETERGENT PRODUCTION

Cosmo Research Institute, a wholly owned subsidiary of Cosmo Oil Co. has received the Japan Petroleum Institute Prize because of the company's and institute's outstanding industrialization development on calcium phenate alkaline detergent. Cosmo Oil Co. plans to increase the capacity of its additive production unit (currenty 6,000 t/y), since having received this award, demand for calcium phenate is increasing, not only within Cosmo itself, but from the outside as well.

Calcium phenate alkaline detergent is blended mainly with automotive or marine engine oil, which contributes to effcient energy use. It is one of the most important lubricant additives, and is widely used, meeting 40% of the total demand for alkaline detergent in Japan.

Cosmo Oil Co. has been improving its calcium phenate detergent since it was first developed in 1971. Cosmo Research Institute which is in charge of R&D, and Cosmo Petrotech Co. which is in charge of sales, have been working together to develop new and unique products.

In 1987 they succeeded in industrializing salicynate detergent (complex of phenate and salicynate) having superior heat resistance.

Salicynate is capable of being used even in the worst conditions resulting from engine miniaturization and raised temperatures. It is already used in Cosmo Oil Co.'s best quality automotive engine oil-''Cosmo Motor Oil SGX''-as the main additive, and shows superior characteristics.

## SANRAKU FINE CHEMICAL'S NEW FACTORY GOES INTO OPERATION

Sanraku Fine Chemical Co. (Head Office: Yamaguchi Prefecture) recently completed construction of a new factory producing ether and solvents in a complex in the Tokuyama Shin-Nanyo area. The factory has already gone into operation.

Sanraku Fine Chemical is a new joint venture between Sanraku Incorporated and Tokuyama Petrochemical Co. As the new factory has been completed, Sanraku has abandoned the Tsukuda factory (Osaka) — a production base for ether and solvents — and will expand and consolidate its ether and solvents business by establishing a new production and supply structure and by combining the achievements of the two parent companies' fine-chemical R&D activities.

Sanraku Fine Chemical's new factory — construction of which started last November — cost Yen 1 billion and has an annual production capacity of 1,000 tons of industrial and reagent ethyl ether, butyl ether and anaesthetic squibb ether, and 1,000 tons of solvents such as dioxane.

## CAPACITY BUILD-UP FOR MAGNETIC METAL POWDER CONTINUING

Dowa Mining Co. — Japan's largest producer of magnetic metal powder —has inaugurated construction aimed at scaling up the production capacity concerned from the current 70 t/m to 120 t/m.

The company expects the product to be applied to the production of 8mm-wide video tape which is now enjoying growing demand.

Kanto Denka Kogyo Co. — the 2nd largest maker in Japan — is also building up production facilities, in a bid to double capacity to 60 t/m. The revamped plant has been partly put into commercial operation. The company hopes for increased application of the product to audio tape.

In addition, Mitsui Toatsu Chemicals, Inc. boosted its production capacity last April to 13 tons a month in the wake of construction work started last fall for plant expansion. The company has hitherto been specialized in audio-tape operations but has now set itself to diversifying into 8mm-wide video tape.

It has been considered for a long time that magnetic metal powder will be extensively used for 8mm-wide tape as a substitute for magnetic iron oxide. In reality, however, its application to the said purpose did not progress so rapidly as expected earlier due to a delay in spread of use of related equipment. Last year, however, Sony's passport-sized video camera sold remarkably well, giving great impetus to demand for 8mm-wide video tape.

The domestic market for metal powder is believed to have expanded to roughly 80 tons a month. The product will form a huge market in a few years.

## YAMANOUCHI, GENETICS INST. FORM JOINT VENTURE FOR BONE GROWTH FACTORS

Genetics Institute, Inc. (U.S.) and Yamanouchi Pharmaceutical Co. have agreed to enter into a joint venture for the commercialization and marketing in Japan of the U.S. firm's bone growth factors (bone morphogenetic proteins BMPs) and other potential future products. They will also form a partnership to fund the development and commercialization of BMPs throughout the world.

BMPs — proteins that stimulate the growth of cartilage and bone — are expected to be useful in the treatment of a variety of orthopedic, dental and bone metabolic indications. Industry analysts have projected the global market for BMP products to be in excess of $2 billion.

Both parties will participate on a 50/50 basis in the profits obtained from the sales in Japan of BMPs and potential future Genetics Institute products. In addition, the U.S. firm will establish a direct pharmaceutical operating presence in Japan and retain exclusive world-wide manufacturing rights for its BMP products.

The planned joint venture between Genetics Institute and Yamanouchi will be responsible for clinical development and marketing of the U.S. firm's BMP products in Japan. It will also have the right of first refusal to develop and commercialize in Japan certain other future products developed by the U.S. interest.

"We see entry into the $37-billion Japanese pharmaceutical market as a key objective in our global business strategy and believe we are the first U.S. biotechnology company to establish a vehicle such as this for direct market presence in Japan", said Tuan Ha-Ngoc, Executive Vice-President of Genetics Institute.

The U.S. firm has succeeded in cloning seven types of BMP, several of which are currently in preclinical testing in a number of model systems.

## SUMITOMO HEAVY IND. FORMS TIES WITH GERMAN FIRM

Sumitomo Heavy Industries Ltd., said it has agreed to set up ties with a West German research institute to obtain its advanced technology to measure abrasion of auto-engine parts. The company said the agreement with Kernforschungszentrum Karlsrhe GmbH will give the company exclusive rights to offer measuring services and to manufacture and market equipment needed for measurement.

# New Developments from Japan

## NEW-TYPE FIBER PRODUCED FROM ETHYLENE-VINYL ALCOHOL COPOLYMER

Kuraray Co. has developed clothing-use compound fiber (trade name: Exe) consisting of polyester use as core fibre and ethylene-vinyl alcohol copolymer (eval) employed as sheath fiber. The new product will be in use after next spring for men's and ladies' wear and sportswear. Its sales target is set at ¥ 600 million for the initial year.

Eval is hydrophilic since it has a hydroxyl group. When transfromed into fiber, it has the same properties as those of natural fibre (silk and flax). The company has succeeded in producing fibre therefrom by improving the thermal resistance of Eval, whose melting point been raised to aboout 180 °C. Eval and polyester were spun separately and the resultant different types of fiber were combined into a single fiber using a gelling spinning method.

"Exe" fiber is superior to polyester fiber in physical properties. Its cross section is round or T-shaped. In the former case, the component ratio for Eval and polyester is temporarily set at 45:55 but the ratio can be freely controlled. Exe's bending rigidity and refractive index are close to that of wool and stand at 1.51 (polyester:1.72), respectively. The product is glossy, has good colorability and is so light (specific gravity: Exe, 1.25; polyester, 1.39) that it has excellent draping properties,. In addition, it also has permanent antistatic properties and deodorizing capability. The new-type fiber will be produced on the scale of 100 tons a year in the intial stage;the production will be expanded to 500 tons three years hence.

## SANYO DEVELOPS ULTRA-LIGHT AMORPHOUS BATTERY

Sanyo Elecric Co. has developed an ultra-light, film-type amorphous bendable battery for use in space, aviation walkens for the disabled, and a portable power source for leisure.

The Osaka-based electric firm is now developing a solar-powered air plane with arrays of the latest battery, brand-named amorton film, on both wings.

The plane is being developed together with U.S. light aircraft maker Ultra Light Soaring Software Co. of Lake Elsinore, California, for marketing over the next few years.

The new plane will attempt a 3,500-kilometer trans-U.S. flight July 1. It completed a 600-meter test flight May 23.

Measuring only 0.12 millimeter in thickness, the amorphous battery has a high power output capacity of 0.2 watt per gram, about 10 times more than that of a glass substrate-type battery.

With a special transparent heat-resisting plastic as a substrate, the new battery has better flexibility, making it difficult to break.

## UBE INDUSTRIES, KURARAY TO START JOINT DEVELOPMENT OF PBT RESIN

Ube Industries and Kuraray have agreed to combine the polymerization and compounding technologies they have developed, and jointly develop polybuteylene terephthalate resin (PBY resin), or polyester thermoplastic resin which is a kind of engineering plastic for the starting of a joint enterprise before the end of next year. In the meantime, the two companies will jointly develop PBT resin of various grades, and push vigorously the development of markets and technology. Before the starting of the joint enterprise, they want to build facilities with an annual production capacity of 5, to 10,000 tons. PBT resin is one of the five major kinds of general-purpose engineering plastics. It is made from terephthalic acid (TPA), or dimethyl terephthalate (DMT), and 1,4- butanediol (1,4 BG). It excels in chemical and heat resistance, rigidity, and dimensional stability. The demand for this kind of resin, which is used in the industrial fields covering electricity, electronics and automobiles, has recorded a double digit increase this year. Demand last year amounted to about 50,000 tons.

Both Ube Industries and Kuraray have been planning to advance into the engineering-plastics field on a full scale. Ube Industries has been dependent on resin production and the compounding technology it has developed via operations involving nylon resin and polypropylene (PP), and Kuraray has relied on polymerization technology developed via polyethylene-terephthalate (PET) operations.

According to the plan, 1,4 BG, which is one of the raw materials, may be purchased exclusively from ARCO (Atlantic Richfield Company) of the United States which started test operations in February; the facilities concerned have an annual production capacity of 35,000 tons and are based on Kuraray's technology.

Ube Industries has started the production of such kinds of engineering plastics as nylon resin and polyphenylene sulfide resin (PPS) on a commercial basis. PBT resin is complementary to nylon resin. Kuraray is to add acrylic resin and ''Eval'' resin (ethylene and vinyl alcohol copolymer) to its PBT resin production. These two companies are thus going to advance into the field of engineering plastics.

Production of PBT resin has been started on a commercial basis by seven companies, including Toray, Polyplastics and Mitsubishi Kasei. It is expected that the competition in PBT-resin sales will become fiercer among these companies hereafter.

## NEW PRODUCT TURNS TRANSPARENT/OPAQUE DEPENDING ON TEMPERATURE

Oki Electric Industry Co. has pioneered heat-sensitive recording material — a combination of polystyrene/polybutadiene copolymer and stearic acid.

The company coated polyester film with the new product to thickness of about 20 microns so that it could assess the product's optical properties.

It found that light was almost incapable of penetrating the product at room temperature in which the permeability stood at 11% and became capable of almost completely penetrating the product when it was heated to above 70°C and as a result, the permeability reached 90%.

It also determined that the permeability remained 63% when the product was cooled down to room termperature and, moreover, turned back to 11% when the product was heated to above 70°C, kept within the temperature range of 57 and 70°C and cooled down to room temperature.

The company claims that the phenomenon of the said permeability varying with cooling-down method will help in the exploitation of the product as recording material.

The new product will be applied to displays, printers and optical recording media. The company has confirmed that it is usable in recording based on a thermal head for fax machines.

The permeability of light for high polymer liquid crystal is controlled through voltage change but that for the new product, through temperature change.

## SPONGE CARBON DEVELOPED

Nippon Steel Chemical Co. and Nippon Steel Corp. have jointly pioneered sponge isotropic carbon having bending strength and compressive strength two and 20 times, respectively, those of carbon felt now in use.

They baked isotropic carbon into a pumice-like product using advanced conditioning/baking technology for refined carbon material.

The new product is being supplied to users in sample form. The two firms plan to install mass-production equipment at the factory of Tohoku Kyowa Carbon, the Nippon Steel group's business foothold for carbon products.

The new product will be used mainly as heat-insulating material for high-temperature vacuum furnaces and high-temperature inert-gas furances.

## ULTRAHIGH-ELASTICITY POLYMER PIONEERED AS SUBSTITUTE FOR METAL

Research Association of Polymer Basic Technology has developed aromatic-heterocyclic-polymer (PIBT) fiber through imidation of polycondensate produced from 2, 6-diaminophenylene benzobisthiazole and pyromellitic anhydride.

The new-type fiber has an ultrahigh modulus in tension reaching 340 GPa, roughly 2.5 times that for Du Pont's Kevlar regarded as representative high-elasticity synthetic fiber.

Corresponding figures for aluminum and iron stand at 70 and 200 GPa, respectively. The polymer concerned can be shaped into any form and is expected to take the place of metal as ultrahigh-elasticity material.

Polyimide is produced through imidation of polyamide. The former is rigid polymer, which is insoluble or hardly soluble in any solvent.

The latter can be shaped into any form and it is possible to obtain high-elasticity, heat-resistant material through imidation of the formed product. The above-mentiond polymer fiber has been produced using this process.

Studies have been conducted throughout the world on how to produce high-elasticity, heat-resistant macromolecular material. Poly-p-phenylene benzobisthiazole — also categorized as an aromatic heterocyclic polymer — has already been developed but it is difficult to shape the product into a desired form since it is insoluble in ordinary organic solvents.

## MANUFACTURING APPROVAL SOUGHT ON HUMAN TNF AGENT FOR 1ST TIME

Dainippon Pharmaceutical Co. has announced that it has applied for manufacturing approval for its inhouse-developed antiskin-cancer agent, trademarked "Tienef", although its application area is much more limited than expected at the time of development. The agent is the first instance of human TNF (tumor-necrosis factor) application to an ethical drug.

TNF, when discovered, attracted great industrial attention but it has since been regarded as having little commercial viability, and only a few companies are now tackling clinical development.

Dainippon has developed mass-production technology for the TNF agent using gene recombination but its administration is limited only to direct injection into the skin afflicted by cancer.

## VLSI-USE FILTER BARED

Mitsubishi Kasei Corp. has developed a polyolefin-applied filter aimed at removing ultrafine particles from water and chemicals, both of which are used for production of 4/16-megabit VLSIs.

# ALUMINIUM CHLORIDE ANHYDROUS

**NO WAITING -- ASSURED BEST QUALITY -- PROMPT DELIVERIES**
**NO WAITING PERIOD -- ANY QUANTITY -- AVAILABLE**
**FOR LONG TERM CONTRACT**

CONTACT LARGEST MANUFACTURERS:

## ARONI CHEMICALS

**(PROP. ARONI COMMERCIAL COMPANY LTD.)**

**REGD. OFFICE**

29, Bank Street, 1st Floor
Fort, Bombay - 400 023
**Phone: 2862453/2863021**
**Gram: METALDIST**
**Tlx: 011-6554 MINA IN**

**HYDERABAD OFFICE**

C/o. I.S.C. Associates
4-3-82, 1st Floor, Hill St.,
Ghasmandi,
**Secunderabad-500 003.**
**Phone: 70602/825429**

**WORKS**

Birlagram
Nagda (M.P.)
PIN. 456 331
**Phone: 104/283**
**Gram: NIYATI**

| | |
|---|---|
| **PETROLEUM ETHER 40°-60°*** | **German** |
| **POTASSIUM CARBONATE*** | **France** |
| **EPICHLOROHYDRINE*** | **Japan** |
| **DIMETHYL ACETAMIDE*** | **USA** |
| **PIVALOYL CHLORIDE*** | **France** |
| **2 ETHYL HEXANOIC ACID* (OCTOIC ACID)** | **Japan** |
| **PYRIDINE 2°** | **Belgium** |
| **METHYLENE CHLORIDE** | **Holland/<br>ICI make** |
| **ISOPROPYL ALCOHOL (IPA)** | **—** |
| **DIMETHYL FORMAMIDE* (D.M.F.)** | **Japan** |

*** (With MODVAT Benefits)**

Kindly forward trade inquiries

## HASMUKHRAY & CO.

198, Mangaldas Building No. 3B, Mangaldas Road, Bombay 400 002.
**Tel. Nos.: 31-7815/29-2386/25-1744 Cable: JAYJANAK Telex: 11-82192 JAY IN**
**Hyderabad Telephone Nos.: 840408/840356**

Regularly Available at Most Competitive Price:

**SACCHARINE PLAIN/SODIUM-I.P.**

**PARA TOLUENE SULPHONAMIDE**
**PARA TOLUENE SULPHONYL CHLORIDE**
**ORTHO TOLUENE SULPHONAMIDE**

Contact Manufacturers:

**SWEETEX CHEMICAL INDUSTRIES**

19, Kapadia Chambers, 51, Devji Ratanshi Marg, Bombay 400 009.
**Phones: 869871/861835/8518333**

---

FOR YOUR REQUIREMENTS OF

**HYFLOSUPERCELL - U.S.A.**
**THIOUREA**
**DICYANDIAMIDE (D.C.D.A.)**
**DIMETHYLAMINE (RCF)**
**TARTARIC ACID**

Please Contact

**JAYDIP AGENCIES**

2-B, Ganga Vihaar, 94, Kazi Sayed Street, Bombay 400 003.
**Phones: Office: 343316/331357 1.00 to 7.30 P.M. Resi.: 6366280 8.00 A.M. to 12.00 Noon**
**Fax: 00-91-22-325620 (JA) Gram: "JAYDIPIMPO" Bombay 56**

---

A Reliable Source Of Supply For
HIGH EXHAUST REACTIVE DYES

CCI Re Yellow HE 4G
CCI Re Golden Yellow HER
CCI Re Orange HE2R
CCI Re Red HE5B
CCI Re Red HE3B
CCI Re Red HE7B
CCI Re Red HE8B
CCI Re Brown HER
CCI Re Brown HE4R
Keyactive Navy Blue HER
Keyactive Navy Blue HE2R
Keyactive Navy Blue HE5R
Keyactive Jade Grade HE4B
Keyactive Green HE4BD
Keyactive Dark Green HE7B
Keyactive Black HERL
Keyactive Blue HERD
Keyactive Purple HE3R

Please Contact the Manufacturers:

**Colour & Chemical Industries**
**Kusum Enterprises**

**Sales Office:**
44, Gaya Building, 4th Floor,
109, Yusuf Meharali Road, Bombay 400 003.
**Phone: Off: 345581 Resi.: 6720195**
**Gram: HONEYSUN, Bombay 90.**
**Telex: 11-71227 CCJ IN.**

**Works:**
Plot No. J-719/2, 40,
Shed Area, GIDC,
Vapi (Gujarat).
**Tel.: 1446**

For your requirements of:

**Industrial filter pad, paper cloths**

- Sparkler filter pad
- Sterile filter pad
- Absorbent (Mosquitoes mat) pad
- Activated carbon filter pad
- Oil filter pad
- Hanks (Pure wool, 100% spun polyester cotton bleach, 100 % cotton yarn)
- Electrical insulating board
- Woven & nonwoven
- pH paper
- Chemicals, solvents
- Binder • Acrylic, auxiliaries
- Paper, textile, leather grade

Please Contact

**J.K. ENTERPRISE**

**Correspondence Office:** 285/A, Parekh Bldg., 1st Floor, Block No. 3,
Opp. Shanmukhananda Hall, Sion East, Bombay 400 022. **Tel.: 482718**
**Sales Office:** Development Bank Bldg., 3rd Floor, Room No. 71,
Crawford Market, Palton Road, Bombay 400 001. **Tel.: 2610919, 2612775**

**Kind Attention: Actual Users, Traders & Exporters For Your Regular Requirements Of:**

**GAMMA ACID, K-ACID, G-SALT, R-SALT SCHAFFER'S ACID and BRONNERS ACID**

Please contact at our Reg. Office & Factory:

**GAMA EXPORTS PVT. LTD.**

Hanumanji Mandir Road, National Highway No. 8, Nandesari Crossing,
AT & PO Poicha (Rania), Dist. Baroda 391 780.
**Phone: Factory: 60433 Resi.: 327209**

**EXPORT ENQUIRIES ARE SOLICITED**

Proven technical know-how for manufacture of following products required

1. Bees Wax IP
2. Disodium Hydrogen Orthophosphate IP
3. Dicalcium Phosphate (Dentrifice & Food Grade)
4. Zinc Sulphate IP & USP
5. Acetamide

Write in confidence to:

**Shri Ramanandan Hegde,**

**NANDU CHEMICALS PVT. LTD.**

40, Vishweshwarnagar, Hubli 580 032.

IF YOUR PROFITS ARE LEAKING ...... WE CAN SEAL THEM

CHAMPION
PTFE/TEFLON & ASBESTOS PRODUCTS

"CHAMPION" BRAND ASBESTOS PACKINGS & JOINTINGS FOR STEAM, HYDRAULICS, ACIDS, ALKALIES, OILS & GASES. 100% PTFE/TEFLON SHEETS, RODS, TAPES, ROPE GASKETS & BRAIDED PACKINGS, ENVELOPE GASKETS, MOULDED & MACHINE PARTS. BLUE/WHITE ASBESTOS BRAIDED PACKINGS IMPREGNATED WITH PTFE/TEFLON. **"SPITMAAN"** RANGE OF NON-ASBESTOS GLAND PACKINGS FOR TOUGHEST SEALING JOBS.

PLUS-GAS INDIA

**"PLUS-GAS-INDIA"** A POWERFUL RANGE OF ANTI-CORROSION FLUIDS & TREATMENT COMPOUNDS MADE IN TECHNICAL COLLABORATION WITH U.K.

CHARMINAR

**"CHARMINAR"** ASBESTOS MILLBOARD GRADE M.574 (GENERAL PURPOSE) 1.5MM TO 12.5MM TH. & GRADE M-674 (SPECIAL PURPOSE) 0.5MM TO 1.5MM TH.

**"SIRWO"** BRAND COMMERCIAL, STEAM - AI, OIL PROOF SYNTHETIC NEOPRENE & ELECTRIC RUBBER SHEETINGS & RUBBER INSERTIONS, HIGH PRSSURE STEAM JOINTINGS **"KLINGERITE"** NON-METALLIC & 1000-METALLIC GASKET SHEETS, **"AVARC"** GRAPHITE FLAKES, RED VULCANISED FIBRE SHEETS & RODS, 85% ASBESTOS MAGNESIA COMPOUND, **HOLDTITE** PASTE & LIQUID, **RUSTOLENE**, GRAPHITE POWDER, IRON CEMENT, **"FLUXITE"** SOLDERING PASTE, **"INDIAN HEAD"** GASKET SHELLAC COMPOUND & **M-SEAL** EPOXY COMPOUND, NYLON RODS & SHEETS.

"CHAMPION" - A TRUSTED NAME IN ASBESTOS, RUBBER, PTFE / TEFLON PACKINGS & SEALS

AUTHORISED STOCKISTS

**SURENDRA TRADING CO.**

129, Narayan Dhuru Street, Bombay 400 003. TEL.: 32 66 15, 34 99 18

SKF-ADVANTAGE

NO. 1 QUALITY • FULL TECHNICAL ASSISTANCE • WIDEST RANGE • EFFICIENT DELIVERY

*Genuine* Bearings For All chemicals ☐ Fertilizer ☐ Petrochemical & Allied Industries

SKF

SKF Authorised Stockist Recognised Importer SIBCO Recognised Stockist

**Purushottam Somabhai & Co.**

SUPPLIERS OF BALL & ROLLER BEARINGS TO REPUTED INDUSTRIES ALL OVER INDIA

36, sarang street p.o. box no. 3014
bombay: 400 003.

phones: office: 326252 ■ 327701 ■ 323217 ■ 341603
phone Resi: 4122353 ■ 4110288
gram: 'FORESIGHT'
telex: 11-76815 PSCO in

PRINT-DESIGN ☎ 422 3615

# MARKET INFORMATION

## Acrylamide, Butyl Acrylate Slumps, Carbitol Shoots

With the dumping of auction materials prices of acrylamide slumped Rs. 10 to Rs. 77 per kg, butyl acrylate by Rs. 5 to Rs. 80 and ethyl acrylate by Rs. 6 to Rs. 66/kg. Acute scarcity of carbitol pushed prices up by Rs. 8 to Rs. 72 + ST. Dyes intermediates remained steady.

**We cannot guarantee the accuracy of the prices published in CHEMICAL WEEKLY as they are based only on the enquiries made by our correspondent -- and, as such they are not FIRM PRICES as between a buyer and seller. The prices are published only with a view to giving some ideas of the market conditions.**

**The prices are inclusive of Excise and Maharashtra Sales Tax.**

**(Prices as on August 7, 1990)**

| INDUSTRIAL CHEMICALS | Per Kg. |
|---|---|
| Ammonium sulphate | 2.50 |
| Ammonium phosphate (Mono) | 14.50 |
| Ammonium phosphate (Di) | 14.50 |
| Ammonium carbonate (Di) | 17.00 |
| Ammonium bicarbonate | 6.00 |
| Ammonium chloride | 3.25 |
| Ammonium nitrate | 6.00 |
| Arsenic white powder | 22+ST |
| Acrylamide (Resale) | 77.00 |
| Barium carbonate | 20.00 |
| Bleaching powder (33% Cl) | 5.00 |
| Borax (Granular) | 16.00 |
| Borax (Powder) | 22.00 |
| Boric acid (Tech) | 32.00 |
| Bisphenol-A | 75.00 |
| Butyl carbitol | 106.00 |
| Caustic soda (Flakes) | 11.50 |
| Caustic soda (Solid) | 12.00 |
| Caustic soda (Lye) | 10.00 |
| Calcium chloride 70% (Solid) | 3.25 |
| Calcium chloride 75-80%(fused) | 3.50 |
| Calcium chloride 36% (Anhydrous) | 5.00 |
| Calcium carbonate (precipitated) | 6.00 |
| Calcium carbonate (Activated) | 5.75 |
| Cobalt oxide | 550.00 |
| Cresylic acid | 62.00 |
| Camphor (Indian) | 105.00 |
| Cream of Tartar (Tech.) China | 70 00 |
| Citric acid (Belgium) (Resale) | 47.00 |
| Citric acid (Indian) (Resale) | 41.00 |
| Copper sulphate | 24.00 |
| Chromic acid | 63.00 |
| Ethylene urea | 58.00 |
| Ferric chloride (Lumps) | 9.00 |
| Ferric chloride (Anhydrous) | 20.00 |
| Glue flakes | 15.00 |
| Glue sheets | 6.75 |
| Gohsenol GH-17 | 128.00 |
| Hydro | 39+ST |

FOR YOUR REQUIREMENT OF

**PARA CHLORO PHENOL**
**ORTHO CHLORO PHENOL**
**MONO CHLORO PHENOL**
**DICHLORO PHENE**
**SULFURYL CHLORIDE**
**E.D.T.A.**
**MONO CHLORO ACETIC ACID (MCA)**
**ISOPROPYL BROMIDE**
**CAUSTIC POTASH FLAKES**
**POTASSIUM CARBONATE**
**NORMAL BUTYL BROMIDE (NBBR)**

Authorised Dealer of

**M/s. Standard Alkali,**
**M/s. Anupam Rasayan,**
**M/s. Odex Chemicals Pvt. Ltd.,**
**M/s. P.K. Velu & Co. Pvt. Ltd.,**

Please Contact:

**Shree Amruta Organics Pvt. Ltd.**

813, Raheja Centre, 214, Nariman Point, Bombay 400 021.
**Phone: 240415, 243979, 2873680 Telex: 11 6053 SATC**

**4A-B, Trade Centre, Near Stadium House,**
**Ahmedabad 380 014.**
**Telephone: 462332**

| | |
|---|---|
| Hyflosupercell | 28.00 |
| Hexamine (Resale) | 36.00 |
| Industrial Wax | 25.00 |
| Litharge | 40.00 |
| Lead Acetate (Tech.) | 39.00 |
| Lithopone | 32.00 |
| Magnesium chloride (Crystal) | 2.00 |
| Menthol crystal (Flakes) | 355+Ex+ST |
| Menthol bold | 425+Ex+ST |
| Menthol crystal cold | 395+Ex+ST |
| Magnesium carbonate (Japan) | 30.00 |
| Magnesium carbonate (Indian) | 26.00 |
| Maleic Anhydride (Resale) | 42.00 |
| Mercury (34.5 Kgs) | 11,500.00 |
| Nickel chloride | 110.00 |
| Oxalic acid (Resale) | 15.00 |
| Peppermint oil (Rectified) | 188+Ex+ST |
| Potassium carbonate (Indian) | 28.00 |
| Potassium carbonate (Imported) | 32.00 |
| Potassium bichromate | 38.00 |
| Potassium phosphate (Mono) | 34.00 |
| Potassium phosphate (Di) | 25.00 |
| Polyvinyl alcohol (No. 117) | 93.00 |
| Polyvinyl alcohol (No. 173) | 135.00 |
| Polyvinyl alcohol (No. 208) | 170.00 |
| Paraformaldehyde (Resale) | 20.50 |
| Phthalic anhydride (Resale) | 33.00 |
| Pentaerythritol (Resale) | 49.00 |
| Paraffin wax | 22+ST |
| Rangolite (German) | 96+ST |
| Rangolite (Czech.) | 72.00 |
| Rangolite (China) | 54.00 |
| Sodium sulphate (Fine) | 3.75 |
| Sodium sulphate (Coarse) | 3.50 |
| Sodium sulphide 50-52% (Flakes) | 11.50+ST |
| Sodium sulphide 58-60% (Flakes) (TCL) | 25.00 |
| Sodium sulphide pure (Flakes) | 12.25 |
| Sodium nitrite (Resale) per 50 kg. | 1,200.00 |
| Sodium chlorite 80% (Spain) | 100+ST |
| Soda Ash (Tata) | 5.40 |
| Soda Ash (Birla) | 5.25 |
| Soda Ash (Imp.) | 5.00 |
| Sodium bicarbonate | 7.00 |
| Sodium bisulphite | 8.00 |
| Sodium silicate | 5.50 |
| Sodium acetate | 7.20 |
| Sodium alginate | 450.00 |
| Titanium Dioxide (Anatase) | 65.00 |
| Titanium Dioxide (Rutile -- $RCR_2$) | 88+ST |
| Tartaric acid | 190.00 |
| Trisodium phosphate | 12.00 |
| Thiourea | 78.00 |
| Urea (Tech.) | 3.00 |
| Vacuum salt | 1.00 |
| Zinc Dust | 52.00 |
| Zinc Oxide | 54.00 |
| Zinc chloride powder (Tech.) | 20.50 |
| Zinc sulphate | 7.00 |

| SOLVENTS | Per Kg. |
|---|---|
| Acetic Acid Glacial (Resale) | 13.00 |
| Acetic Anhydride (Resale) | 33.50 |
| Acetone (Resale) | 19.00 |
| Adipic Acid | 90.00 |
| Aceto Acetanilide | 55.00 |
| Aniline Oil (HOC) | 46.00 |
| Benzoate Plasticiser | 62.00 |
| Butyl acrylate | 75.00 |
| Butyl stearate | 38.00 |
| Butanol | 32.00 |
| Benzyl Alcohol | 60.00 |
| Benzyl Chloride | 34.00 |
| Benzo trichloride | 16.00 |
| Benzoyl chloride | 22.00 |
| Bromine Liquid | 68.00 |
| Chloroform | 30.00 |
| Carbon Tetrachloride | 20.00 |
| Cellosolve | 58.00 |
| Cyclohexanone | 64.00 |
| Cyclohexanol | 58+ST |
| Diacetone (Resale) | 26.75 |
| Diethyl Oxalate | 34.00 |
| Diethyl glycol (DEG) | 25+ST |
| Dioctyl Phthalate | 44.00 |
| Diallyl Phthalate | 41.00 |
| Dimethyl Phthalate | 28.00 |
| Dioctyl Adipate | 52.00 |
| Dibutyl Adipate | 42.00 |
| Dipentene | 15.00 |
| Dimethylamine 40% | 30.00 |
| Dimethylamine 50% | 35.00 |
| Ethyl Acetate | 15.50 |
| Ethyl Acrylate | 66.00 |
| Ethylene Dichloride | 18.50 |
| Ethylene Glycol | 32.00 |
| Formic Acid (Imp.) | 24.00 |
| Formaldehyde (Resale) | 6.50 |
| Glycerine (CP) | 55.00 |
| Glycerine (IW) | 54.00 |
| Hydrogen Peroxide 50% (Resale) | 35.00 |
| Isopropyl Alcohol | 26.00 |
| Isobutyl Alcohol (Resale) | 35.00 |
| Monoethanolamine (Resale) | 95.00 |
| Melamine | 60.00 |
| Methyl Ethyl Ketone | 36.00 |
| Methyl Isobutyl Ketone | 38.00 |
| Methyl Acrylate | 68.00 |
| Methylene Dichloride (Resale) | 16.50 |

**FOR YOUR REQUIREMENTS OF:**

**Di Octyl Phthalate (D.O.P.)**
**Di Butyl Phthalate (D.B.P.)**
**Di Butyl Maleate (D.B.M.)**
**Di Octyl Maleate (D.O.M.)**
**Di Octyl Adipate (D.O.A.)**
**Butyl Stearate**

PLEASE CONTACT MANUFACTURERS:

**Vikram Plasticizer**

1204, Dalamal Tower, Plot No. 211,
Nariman Point, Bombay 400 021.
Phones: 230006, 231192, 233554, 233562

**For Competitive Import of Pharmaceutical Substances, Chemicals & Raw Materials and Particularly the following items:**

ERGOT ALKALOIDS
SULPHONAMIDES
ANTIBIOTICS
AMINO ACIDS
INSECTICIDES
FUNGICIDES

HERBICIDES
RODENTICIDES
REPELLANTS
PHEROMONES
CARDIAC GLYCOSIDES
ANTI CANCER DRUGS

LITHOPONE, RANGOLITE
CAPROLACTAM
POTASSIUM & SODIUM HYDROXIDE
OXALIC ACID
ESSENTIALS OILS AND AROMATIC PRODUCTS

RUBBER CHEMICALS, CONVEYOR BELTS, RUBBER PROCESSING AGENTS

Please Contact Exclusive Representatives Of:

**M/s. CHEMAPOL, CZECHOSLOVAKIA**
**M/s. N. JIVANLAL & CO. PRIVATE LIMITED**

Rawat Manzil, 2nd Floor, 50, Shamaldas Gandhi Marg, Bombay 400 002.
Tel.: 251685/252527/253193 Tlx.: 011-3865 Gram: NIRANJAN

**Now Available Ready Stock At Most Competitive Rates:**

BENZOYL PEROXIDE (All grades)
BENZOYL CHLORIDE
ACETYL CHLORIDE
CHLORO ACETYL CHLORIDE
PROPIONYL CHLORIDE
2-CHLORO PROPIONYL CHLORIDE

**ALSO AVAILABLE SPARE CAPACITIES TO MANUFACTURE BULK DRUGS.**
**INTERESTED PARTIES MAY CONTACT:**

**PRERNA CHEMICALS**

16, Cawasji Patel Street, Fort, Bombay 400 001.
Phones: Office: 2870541/2871751 Works: Ambarnath - 2771

For Your Regular Requirements of:

Acetonitrile
Acetyl chloride
Acrylamide * Acrylonitrile
Allyl Alcohol
Alpha Picoline
Butyl Cellosolve * B.H.T.
Chloroform * Cyclohexane
Di Methyl Formamide
Di Methyl Sulphoxide
Epichloro Hydrine
Ethylene Dichloride
Formic Acid -- 99% & 85%
Hydroxylamine Hydrochloride

Hydroxylamine Sulphate
Iso Amyl Alcohol
Iso Butyl Alcohol
Iso Butyric Acid
Iso Propyl Alcohol
Lithium Hydroxide
Magnesium Oxide
Malonic Acid
Methyl Cellulose 4000
Methyl Cellosolve
Methyl Formate
Morpholine
Methyl Ethyl Ketone

N. Butyl Amine * N. Butyric Acid
N. Heptane * N. Propyl Amine
Quinoline * P.C.B.A.
Para formaldehyde 84-85%
Perchloro Ethylene
Petroleum Ether 40-60%, 60-80%, 60-95%
Secondary Butanol
Sodium Methoxide
Soya Lecithin Powder
Thiourea
Tri-Chloro Ethylene, T.E.G.
Tertiary Butyl Alcohol
Xanthone * Zinc dust

H.P.M.C. 5 CPS, 15CPS, 50CPS, 606 CPS

Please Contact: **Rajendra & Company**

Gopal House, 2nd Floor, 7/9, Kumbharwada Cross Lane, Veer Vithaldas Chandan Street, BOMBAY 400 003.
Phones: 321020/339968/344937 Residence: 6124644/6122149

| | |
|---|---|
| Carbitc. | 72+ST |
| Meta Cresol | 45.00 |
| Nitrobenzene | 19 00 |
| Nitric Acid (Conc.) (RCF) | 2.50 |
| Ortho Cresol | 30+ST |
| Phenol (Resale) | 38 50 |
| Propylene Glycol | 52.00 |
| Polyethylene Glycol (No.200) | 50 00 |
| Polyethylene Glycol (No.400) | 65 00 |
| Polyethylene Glycol (No.500) | 52.00 |
| Polyethylene Glycol (No.1600) | 54.00 |
| Polyethylene Glycol (No.4000) | 80.00 |
| Polyethylene Glycol (No.6000) | 85.00 |
| Para Cresol | 110.00 |
| Styrene Monomer | 42.00 |
| Sorbitol | 14.00 |
| Sulphuric Acid | 2.80 |
| Trichloroethylene | 26.00 |
| Triethanolamine (Resale) | 85.00 |
| Turpentine Oil (Germany) | 8.00 |
| Turkey Red Oil (50%) | 20.00 |
| Vinyl Acetate Monomer | 52.00 |

| SOLVENTS | Per Litre |
|---|---|
| Benzene | 11.00 |
| N-Heptane | 10.50 |
| N-Hexane | 11.00 |
| Methanol | 8.50 |
| Solvent Naphtha Heavy | 10.50 |
| Solvent Naphtha Light | 8.50 |
| Toluene | 11.75 |
| Xylene | 22.00 |

## DYES INTERMEDIATES (PRICES ARE WITHOUT TAX AND EXCISE)

| | |
|---|---|
| Alphanaphthylamine | 65.00 |
| Alpha Naphthol (Imp.) | 155.00 |
| Aceto Acetic Ester (Methyl) | 65.00 |
| Ammonium Molybdate | 210.00 |
| Anthraquinone | 140.00 |
| Anthranilic Acid | 75.00 |
| 2-Amino 4-Nitrophenol | 140.00 |
| Blue B. Base (Local) | 285.00 |
| Beta Naphthol (Atul) | 71.00 |
| Benzidine Dihydrochloride (BDH) | 76.00 |
| Bromamine Acid | 445.00 |
| BON Acid (Incl. of excise) | 140.00 |
| Chicago Acid (Atul) | 350.00 |
| Coach Acid | 52.00 |
| C. Acid (Imp.) | 210.00 |
| Cyanuric Chloride | 150.00 |
| 2,4- DNCB | 27.00 |
| Dihydrothio PTOS (Imp.) | 1,300.00 |
| Dimethyl Aniline | 64.00 |
| Diethyl Aniline | 145.00 |
| Diamino stilbene disulphonic acid | 155.00 |
| 3,3-DCB (Imp.) | 200.00 |
| Gamma Acid (Atul) | 205.00 |
| H. Acid (Atul) | 95.00 |
| G. Salt | 70.00 |
| Isophthalic Acid | 50.00 |
| J. Acid | 330.00 |
| J. Acid Urea | 440.00 |
| K. Acid | 110.00 |
| MPDS (German) | 185.00 |
| MNA | 125.0 |
| Meta Ureido Aniline | 175.0 |
| MPD (Local) | 160 0 |
| MPD (Japan) | 180.0 |
| Naphthenic Acid | 46.0 |
| N-Methyl J. Acid | 525 0 |
| N-Methyl Aniline | 120.0 |
| Naphthalene (Refined) | 24.0 |
| Ortho Anisidine (OA) (Imp.) | 110.00 |
| Ortho Dichloro Benzene (ODCB) | 18.00 |
| OT Base | 125.00 |
| Para Dichloro Benzene (PDCB) | 28.00 |
| Para Anisidine (PA local) | 130.00 |
| PNA | 88.00 |
| Para Cresidine (Imp.) | 380.00 |
| Para Amino Azo Benzene (India) | 135.00 |
| PNCB (HOC) | 58.00 |
| Para Amino Acetanilide | 200.00 |
| 1-Phenyl 3-Methyl 5-Pyrazolone | 140.00 |
| Phenyl J. Acid | 350.00 |
| Para Amino Benzoic Acid | 135.00 |
| PT Base | 135.00 |
| Rhoduline Acid | 520.00 |
| Resist Salt 80% | 28.00 |
| Resorcinol | 230.00 |
| Sodium Naphthionate | 65.00 |
| 5-Sulpho-Anthranilic Acid | 78.00 |
| Sulphanilic Acid | 33.00 |
| Sulpho Tobias Acid | 145.00 |
| Trichloro Benzene (TCB) | 22.00 |
| Tobias Acid (Imp.) | 138.00 |
| Metanilic Acid | 43.00 |
| MTD | 125.00 |

**We Manufacture Chemicals For Industrial Use**

- Acetic Acid
- Acetic Anhydride
- Acetaldehide
- Industrial Alcohol
- Monochloro Acetic Acid
- Ethyl Acetate
- Butyl Acetate
- EDTA
- NTA
- Carboxy Methyl Cellulose

**ASHOK ORGANIC INDUSTRIES LTD.**
406,Sharda Chambers, 33,Sir Vithaldas Thackersey Marg (New Marine Lines),Bombay-400 20
Phone : 252236 : 252256 : 317511 Gram : 'ASHOKBROS' Telex : 11-3853 AOIL IN

**Also Please Contact:**
**Baroda** : Phones : 324519-325769
Telex : 0175-597 AOIL IN
**Ahmedabad** : Phone : 78009
**Ankleshwar** : Phone : 2461-2462
Telex : 0189-238 AOIL IN
**New Delhi** : Phones : 5710733-5711057
**Calcutta** : Phones : 282474-282475
Telex : 021-7917 SBIL IN
**Madras** : Phone : 582046
Telex : 041-7527 SBIL IN
**Bangalore** : Phones: 570746-570760
Telex : 0845-8275 SBIL IN
**Hyderabad** : Phones : 73737-831049
**Poona** : Phone: 50797

Plants at : Nandesari - Baroda; GIDC Ankleshwar; Boridra - Bharuch

Please Contact For Your Requirement Of:

**Carbon Tetrachloride**

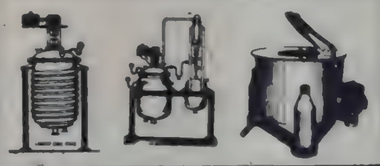
**M.M. INDUSTRIES**

432, Arun Chambers,
Tardeo Main Road,
Bombay 400 034.
**Telex No.: 011-71682-CHEM IN**

**Phones: 4938395**
**4949655**
**4949656**
**Fax No.: 4937089**

**Authorised Dealer of M/s. NATIONAL RAYON CORPORATION LTD.**

***BILLY - PEOPLE WHO KNOW WHAT CHEMICAL PLANT AND PROCESS INDUSTRY IS ALL ABOUT!***



**Our Manufacturing Range :**
- ★ CENTRIFUGES
- ★ EVAPORATORS
- ★ CRYSTALLISERS
- ★ BALL MILLS

★ MULTI MILLS ★ HEAT EXCHANGERS ★ TRAY DRYERS
★ REACTION VESSELS ★ DRUM DRYERS
★ FILTER PRESSES, ETC.

**Available under IDBI Deferred Payment Scheme**

Designers, Engineers & Manufacturers
**BILLY ENGINEERING ENTERPRISES**
**761, Thiruvottiyur High Road Madras-600 081. Phone ; 554619**

HOT NEWS FOR **AEROSIL** USERS

The much-awaited import-substitute for **AEROSIL/FUMED SILICA**
manufactured indigenously under German technical know-how

**MICROSIL**

**(COLLOIDAL SILICON DIOXIDE - NF)**

*FOR USE IN:* PHARMACEUTICALS & COSMETICS,
PLASTIC REINFORCEMENT, PAINTS, ADHESIVES, RESINS ETC.

Contact Manufacturers:

**LEUCHTSTOFFWERK (INDIA) PVT. LTD.**

Phone: 224128 Post Box No. 2003, BOMBAY - 400 002. Gram: "GLOWORM"

# Bombay Dyes Market

| ACID COLOURS | Per Kg. |
|---|---|
| Acid Violet 4BS | *190.00 |
| Acid Maroon V | 110.00 |
| Acid Orange II | 112.55 |
| Acid Orange IIY | 93.85 |
| Acid Red A | 137.00 |
| Acid Scarlet 3R | 128.35 |
| Acid Red 3BN | *195.00 |
| Acid Red R2R | 132.00 |
| Acid Red RS | 88.00 |
| Acid Patent Blue AS | *280.00 |
| Acid Green V | *375.00 |
| Acid Coomasi Blue | 200.00 |
| Acid Yellow 5GN | 65.00 |
| Acid Red PG | 85.00 |
| Acid Red GRS | 78.00 |
| Acid Black 10 BX | 157.15 |
| Acid Black BX | 126.95 |
| Acid Black Wax | 135.50 |
| Crosein Scarlet MOC | 200.30 |
| Procinil Yellow GS (ICI, UK) | 265.00 |
| Procinil Red GS (ICI, UK) | 530.00 |
| Procinil Blue RS (ICI, UK) | 315.00 |
| Procinil Scarlet G (ICI, UK) | 600.00 |
| Procinil Orange G (ICI, UK) | 250.00 |
| Procinil Rubine (ICI, UK) | 550.00 |

* To get resale price add 6% tax

| DIRECT COLOURS | Per Kg. |
|---|---|
| Yellow 3GX | 114.00 |
| Gun Yellow RCH | 175.85 |
| Fast Yellow GCH | 171.50 |
| Yellow CFG Hly. Conc. | 721.00 |
| Fast Yellow GS | 126.96 |
| Fast Yellow CHRS | 116.85 |
| Viscose Orange A | 210.35 |
| Fast Orange GR | 171.50 |
| Red | 122.65 |
| Dark Tan | 98.15 |
| Red IIR | 98.15 |
| Red 4B | 217.55 |
| ordeaux BW | 170.10 |
| ast Scarlet 4BS | 223.50 |
| ed 12B | 220.45 |
| ordeaux Hly. Conc. | 249.20 |
| otton Red N | 117.05 |
| rill. Fast Helio B | 362.85 |
| Brill. Fast Helio 2R | 385.85 |
| Brill. Fast Helio 2RS | 177.30 |
| Brill. Fast Helio BS | 116.10 |
| Brill. Violet Extra | 181.45 |
| Blue 2B | 102.50 |
| Blue G | 220.45 |
| Sky Blue FB | 242.00 |
| Copper Blue GR | 190.25 |
| Fast Greenish Blue GI | 114.60 |
| Developed Black BT | 149.95 |
| Blue NB-2B | 348.45 |
| Blue NB-2BG | 214.70 |
| Developed Black NB-GHB | 214.70 |
| Green B | 142.75 |
| Green NB-B | 218.90 |
| Green 2B-N | 218.90 |
| Brown MR | 197.40 |
| Brown CN | 137.00 |
| Golden Brown G | 175.85 |
| Catechin G | 155.70 |
| Omega Tan | 161.45 |
| Catechin GS | 102.80 |
| Black E Hly. Conc. | 180.15 |
| Black E Extra Hly. Conc. | 180.15 |
| Black NB-ER Hly. Conc | 290.50 |
| Red 2B | 422.40 |
| Red FB | 425.80 |
| Red Violet FBL | 622.00 |
| Orange 3R | 254.20 |
| Violet 3R | 370.50 |
| Violet RL | 355.70 |
| Violet 6R | 638.20 |
| Scarlet RR | 283.50 |
| Rubine 3B | 289.10 |
| Rubine CB | 449.50 |
| Blue GL | 419.00 |
| Blue BGF | 805.80 |
| Navy Blue RE | 359.90 |
| Brown 3REL | 272.80 |
| Black GEL | 420.10 |
| Dark Brown 3B | 411.10 |

| DISPERSOL COLOURS | Per Kg. |
|---|---|
| Red B 3B Conc | 611.50 |
| Red B 2B Conc | 797.90 |
| Red CB Powder | 1048.25 |
| Red D2B Powder | 599.85 |
| Violet C 4R Conc. | 1202.70 |
| Blue BG Conc | 580.65 |
| Blue BN Powder | 128.20 |
| Blue D 2R Powder | 586.25 |
| Navy BT Conc | 531.95 |
| Blue B 2G Conc | 577.95 |
| Black BT Conc | 319.50 |
| Blue BR | 482.40 |
| Yellow 7GL | 813.20 |
| Yellow 5RX | 269.90 |
| Yellow 3G | 473.20 |
| Yellow | 140.00 |
| Yellow AL | 167.20 |
| Yellow Brown REL | 311.70 |
| Yellow FFL | 571.40 |
| Gold Yellow GG | 320.80 |
| Pink REL | 593.00 |
| Red BEL | 615.60 |

| BASE COLOURS | Per Kg. |
|---|---|
| Fast Yellow GC | 77.75 |
| Fast Orange GC | 128.40 |
| Fast Scarlet R | 198.05 |
| Fast Scarlet RC | 128.40 |
| Fast Scarlet RCR | 105.60 |
| Fast Scarlet G | 115.75 |
| Fast Scarlet GN | 92.95 |
| Fast Scarlet GG | 77.75 |
| Fast Scarlet GGS | 73.95 |
| Fast Red B | 233.50 |
| Fast Red RC | 115.75 |
| Fast Red R Flakes | 158.80 |
| Fast Red TR | 181.60 |
| Fast Red TR Oil | 223.35 |
| Fast Red RL | 251.20 |
| Fast Red KB Oil | 251.20 |
| Fast Bordeaux GF | 236.00 |
| Fast Garnet GBC | 103.05 |
| Fast Violet B | 548.80 |
| Fast Blue BB | 566.50 |

| NAPHTHOL COLOURS | Per Kg. |
|---|---|
| ASG | 301.85 |
| AS | 205.65 |
| ASSW | 379.10 |
| ASBS | 253.75 |
| ASBO | 266.40 |
| ASD | 209.45 |
| ASOL | 243.60 |

| | |
|---|---|
| STR | 369.00 |
| SPH | 336.05 |
| SE | 236.00 |
| SEL | 249.95 |
| SLB | 2002.35 |
| SBT | 2459.45 |
| SWG | 143.00 |
| SSG | 538.65 |
| SSR | 652.60 |

| PROCION COLOURS | Per Kg. |
|---|---|
| Golden Yellow HR | 207.95 |
| Brill. Yellow H4G | 145.65 |
| Supra Yellow H-6GP | 168.55 |
| Brill. Yellow HE6G | 214.75 |
| Yellow G-E4R | 276.05 |
| Brill. Yellow H7G | 332.30 |
| Yellow M4R | 275.45 |
| Yellow MGR | 387.65 |
| Brill. Yellow M4G | 201.15 |
| Brill. Yellow M8G | 366.10 |
| Yellow M3R | 244.70 |
| Brill. Orange H2R | 303.80 |
| Brill. Red H7B | 157.95 |
| Brill. Orange M2R | 313 15 |
| Brill Red H8B | 213.55 |
| Brill. Scarlet H RN | 245.05 |
| Supra Red H-3BP | 179.80 |
| Brill. Red H-F3B | 243.45 |
| Brill. Magenta HB | 182.00 |
| Brill Red M 5B | 160.05 |
| Brill Red M 8B | 218.35 |
| Brill. Pink MB | 137 10 |
| Brill. Magenta MB | 163.65 |
| Brill. Purple H-3R | 219.55 |
| Brill. Purple H-7R | 175.40 |
| Navy Blue H 3R | 333.75 |
| Brill Blue H-GR | 406.40 |
| Brill. Blue H5G | 207 95 |
| Blue H 5RX | 286.20 |
| Brill. Blue H 7G | 213.95 |
| Brill. Blue H 7RX | 358.15 |
| Turquoise HA | 265.05 |
| Supra Blue H-3RP | 595.30 |
| Supra Turquoise H 2G P | 181.50 |
| Blue H-FRD | 305.80 |
| Navy Blue H3R | 333.75 |
| Blue H 5RX | 286.20 |
| Navy Blue M3R | 355.70 |
| Brill. Blue MR | 405.60 |
| Brill. Blue M RX | 214.20 |
| Brill. Blue M-G | 226.45 |
| Blue M 4GD | 369.40 |
| Navy Blue M RB | 341.85 |
| Turquoise M-G | 240.30 |
| Brill. Blue M GX | 516.25 |
| Blue 3R Acra Powder | 718.20 |
| Dark Brown H 6R | 248.45 |
| Cobalt Oxide | 285.00 |
| Green H4BD | 287.00 |
| Green H-E4BI | 169.80 |
| Red Brown H IF | 143.25 |
| Orange Brown H 28 | 209.05 |
| Brown M GRN | 188.80 |
| Black H-N | 314.20 |

| SULPHUR COLOURS | Per Kg. |
|---|---|
| Navy Blue | 210.35 |
| Green G | 194.55 |
| Black Grains Extra | 72.25 |
| Black Grains OG | 73.70 |
| Black GXE Conc. | 70.85 |
| Black GXE | 57 90 |
| Black GXR | 69.40 |
| Black Grains 800 | 62.80 |
| Black EXR Grains | 73.70 |
| Black EXR Grains 800 | 59.35 |

| VAT COLOURS (ICI) | Per Kg. |
|---|---|
| Yellow 5G Supra Disperse | 561 85 |
| Yellow 5G Acra Conc | 818 60 |
| Gold Orange 3G Pdr. Fine | 1158 45 |
| Brill. Orange 6R Pdr. Fine | 624 35 |
| Gold Orange 3G Supra Disp | 693 85 |
| Brill. Orange 6RX Powder | 394.30 |
| Brill. Red 3B Pdr. Fine | 1214.15 |
| Brill. Red 3B Supra Disp | 867.45 |
| Brill. Purple 3R Acra Powder | 827 05 |
| Brill. Purple 2R Hly Conc. | 744.25 |
| Brill. Purple 4R Supra Disp. | 604.25 |
| Brill. Purple 2R Acra Conc. | 779.85 |
| Blue 2R Powder Fine | 675.30 |
| Blue BC Acra Con Pdr. Fine | 1013.15 |
| Blue BC Conc. Pdr. Fine | 713.65 |
| Blue R Conc. Pdr. Fine | 719.70 |
| Blue Conc. Powder | 645.80 |
| Brill. Blue 2R Hly. Conc. | 378.55 |
| Blue RR Supra Powder | 629.35 |
| Brill. Blue 2R Supra Disp. | 115.65 |
| Dark Blue 2R Powder Fine | 512.65 |
| Blue BC Supra Disp. | 419.65 |
| Jade Green XBN Powder Fine | 555.80 |
| Jade Green XBN Acra Conc. Pdr | 1026.05 |
| Jade Green 2G Pdr. Fine | 533.25 |
| Jade Green 2G Ptg. Paste | 125.40 |
| Jade Green XBN Ptg. Paste | 126.00 |
| Jade Green 2G Supra Disp. | 618.00 |
| Olive D Pdr. Fine | 563.90 |
| Olive Green B Supra Disp. | 421.70 |
| Jade Green XBN Supra Disp. (N) | 327.30 |
| Olive OMW Powder Fine | 698.55 |
| Olive OMW Supra Disp. | 538.05 |
| Olive D Supra Disp. | 361.70 |
| Olive R Supra Disp. | 470.25 |
| Olive D. Ptg. Paste | 193.00 |
| Olive Green B Ptg. Paste | 199.10 |
| Olive Green B Acra Conc. | 741.10 |
| Olive R Acra Conc.. | 779 85 |
| Brown R Pdr. Fine | 869.45 |
| Dark Brown 3R Fine | 826.25 |
| Brown G Supra Disp | 582 05 |
| Brown 2G Supra Disp | 716 10 |
| Brown R Supra Disp | 547 35 |
| Brown BR Powder | 867.75 |
| Dark Brown 3R Ptg. Paste | 217 15 |
| Dark Brown 3R Supra Disp | 529 60 |
| Brown G Acra Conc. | 967.95 |
| Brown M. Powder Fine | 768.80 |
| Grey M. Supra Disp. | 585.45 |
| Blue BC Acra Conc. Pdr. Fine | 762.70 |
| Direct Black AC Supra Disp. | 415.75 |
| Direct Black AC Pdr. Fine | 574 70 |
| Direct Black CH Supra Disp. | 190 45 |
| Direct ACD Ptg. Paste | 217 15 |

# Delhi Market

**DELHI: AUGUST 14, (NNS)**Hydrogen peroxide jumped up sharply by Rs. 4 at Rs. 37 per kg in the Delhi chemicals market during last week, on account of fall in import, coupled with dwindling stock of indigenous goods, says NNS. In Bombay hydrogen peroxide shot up from Rs. 30 to Rs. 35. As a result of dwindling supply and increased demand from khandsari manufacturers, sodium hydrosulphite kalali moved up by 50 paise at Rs. 40.50 per kg. Sodium hydrosulphite Gulshan and Damosha also remained firm at Rs. 37.50 and Rs. 39 per kg. Camphor thal hardened again by Re. 1 at Rs. 108 on account of increased demand from the traders of Northern and Southern India.

Ammonia bicarb suffered a setback of Rs. 30 at Rs. 150 per 25 kg owing to improved supply and withdrawal of fresh demand from bakeries. Similarly, in view of persistent supply, boric acid technical declined by Rs. 100 at Rs. 1,525 per 50 kg. Sodium nitrite Deepak marka and Chinese dropped by Rs. 25 and Rs. 50 at Rs. 1,300 and Rs. 1,100 per 50 kg in the absence of buying support. Caustic soda flakes drifted lower by Rs. 5 at Rs. 530 owing to poor buying support, because of rainy weather. Arrivals of around 4-5 tonnes of menthol from U.P. were reported and prices of menthol medium and bold quality dropped by Rs. 10 each at Rs. 310 and Rs. 350, whereas mentha oil prices rose by Rs. 5 on good stockists demand. Likewise menthol flake remained firm at Rs. 285 due to rise in speculative activities.

Match wax suffered a steep fall of Rs. 750 at Rs. 15,750 per tonne for want of buying support. Residue and slack wax tumbled down by Rs. 200 at Rs. 3,800 and Rs. 10,200, on account of increased offerings by stockists due to fear of official raids. Paraffin wax remained quiet at Rs. 975. Mercury ruled quiet at Rs. 11,000 per flask, titanium dioxide TTP, K-brand and RC-822 remained static at Rs. 64, Rs. 61 and Rs. 87 per kg respectively, because of increased demand from plastic and paint units. Offtake was restricted in dyes and colours during the week, in view of rainy season.

## (DELHI MARKET RATES AS ON AUGUST 3, 1990)

| | |
|---|---|
| Ammonia Bicarb (Per 25 Kg.) | 150.00 |
| Mercury (Per flask) | 11,000.00 |
| Soda ash (Per bag) | 360/380.00 |
| Ammonium Chloride (50 Kg.) | 120/180.00 |
| Caustic soda flakes (50 Kg.) | 530.00 |
| Citric acid (Per 50 Kg.) | 1,925/2,375.00 |
| Stable Bleaching Powder Shriram (Per 25 Kg.) | 101.00 |
| Stable Bleaching Powder KCl (Per 25 Kg.) | 90.00 |
| Stable Bleaching Powder Maruti (Per 25 Kg.) | 91.00 |
| Stable Bleaching Powder Modi (Per 25 Kg.) | 92.00 |
| Sodium Bicarbonate (50 Kg.) | 315/325.00 |
| Sodium Hydrosulphite (Per Kg.) | 37.50/40.00 |
| Rangolite (Per Kg.) | 83.00 |
| Tartaric acid France (Per Kg.) | 290.00 |
| Sufolite (Per Kg.) | 56.00 |
| Chatkolite (Per Kg.) | 54.50 |
| DMO (per Kg.) | 80.00 |
| Boric acid Technical (Per 50 Kg.) | 1,525.00 |
| Paraffin Wax (Per 50 Kg.) | 975.00 |
| Slack wax (Per metric tonne) | 10,400.00 |
| Tartaric Acid (Swastik Per Kg.) | 225.00 |
| Borax Granular (Per 50 Kg.) | 800.00 |
| Borax Crystal (Per 50 Kg.) | 825.00 |
| Sodium Nitrite (Per 50 Kg.) | 1,150/1,300.00 |
| Sodium Nitrate (Per 50 Kg.) | 500.00 |
| Camphor Thal (Per Kg.) | 108.00 |
| Camphor Powder (Per Kg.) | 96.00 |
| Menthol Bold (Per Kg.) | 350.00 |
| Menthol Medium (Per Kg.) | 310.00 |
| Menthol Flake (Per Kg.) | 285.00 |
| Mentha Oil (Per Kg.) | 200.00 |
| Glycerine (Per Kg.) | 55/58.00 |
| Sodium Silicate (Per quintal) | 300/400.00 |
| Hexamine (Per Kg.) | 34.00 |
| Acetic Acid Glacial (Per Kg.) | 13.75 |
| Copper Sulphate (Per quintal) | 2,300/2,600 |
| Formic Acid (Per Kg.) | 24.00 |
| Formaldehyde (Per Kg.) | 8.50 |
| Hydrogen Peroxide (Per Kg.) | 37.00 |
| Calcium Carbonate (Per Tonne) | 2,800/5,800 |
| Acid Slurry Soft (Per Kg.) | 27.00 |
| Acid Slurry Hard (Per Kg.) | 32.00 |
| Phosphoric Acid (Per 50 Kg.) | 1,235.00 |
| Potassium Nitrate (Per quintal) | 1,000/1,250.00 |
| Potassium Permanganate (Per 50 Kg.) | 2,600/3,000.00 |
| Sodium Bichromate (Per 50 Kg.) | 1,575/1,600.00 |
| Trisodium Phosphate (50 Kg.) | 570.00 |
| Titanium Dioxide Anatase T.T.P (Per Kg.) | 64.00 |
| Titanium Dioxide RC-822 (Per Kg.) | 87.00 |
| Titanium Dioxide Anatase K-Brand (Per Kg.) | 61.00 |
| Titanium Dioxide RCR-2 (Per Kg.) | N.A. |
| Zinc Oxide (Per Kg.) | 46.00/50.00 |
| Phenol Carbolic Acid (Per Kg.) | 39.00 |
| Carbon Tetrachloride (Per Kg.) | 24.75 |
| Chloroform (Per Kg.) | 28.00 |
| Sodium Sulphate (Per metric tonne) | 3,600/3,900.00 |
| Naphthalene Balls (Per 50 Kg.) | 1,375.00 |

| DYES & COLOURS | (Per Kg.) |
|---|---|
| Naphthol AS | 175/211.50 |
| Naphthol ASG | 180/249.70 |
| Naphthol ASBS | 210/260.75 |
| Naphthol ASTR | 300/378.92 |
| Naphthol ASOL | 210/250.90 |
| Naphthol ASBO | 195/274.30 |

| DIRECT DYES | (Per Kg.) |
|---|---|
| Black E. Conc. | 120/185.30 |
| Diazo Black B.T. | 105/154.50 |
| Green B | 90/147.55 |
| Blue 2-B | 60/107.00 |
| Blue 2-B 225% (JNR) | 125.00 |
| Sky Blue FB | 160/248.20 |
| Basic Auramine | 55/110.00 |
| Basic Rhodamine | 300/425.00 |
| Basic Methylene Blue | 100/180.00 |
| Basic Violet | 165/210.00 |
| Basic Malachite Green | 175.00 |
| Acid Orange | 75/111.20 |
| Congo Red H/C | 75/120.95 |

# Madra's Market

Prices remained stable over the week. Trading has been on a low key. The market is not holding any expectations and the dull conditions are expected to last for atleast till the end of this month.

## (MADRAS MARKET RATES AS ON AUGUST 4, 1990)

| | |
|---|---|
| Acetic Acid Glacial (per kg) | 14.50 |
| Aluminium Sulphate Iron free (per MT) | 4,000.00 |
| Ammonium Bicarbonate (per 25 kgs) | 150.00 |
| Ammonium Chloride (per MT) | 2,100.00 |
| Acid Slurry (per kg) | 31.00 |
| Barium Carbonate (per kg) | 11.00 |
| Barium Chloride (per kg) | 10.00 |
| Boric Acid Technical (per kg) | 26.00 |
| Bleaching Powder (per 50 kgs) | 225.00 |
| Borax (per 50 kgs) | 780.00 |
| Caustic Soda Flakes -- Mettur Chemicals (per MT) | 11,500.00 |
| Caustic Soda Flakes -- Andhra Sugars (per MT) | 11,500.00 |
| Calcium Chloride 70% Solid (per MT) | 3,500.00 |
| Calcium Chloride Anhydrous (per MT) | 6,500.00 |
| Calcium Carbonate (Activated) (per MT) | 6,500.00 |
| Calcium Carbonate (Precipitated) (per MT) | 5,500.00 |
| Citric Acid (per kg) | 48.00 |
| Copper Sulphate (per kg) | 24.00 |
| Cresylic Acid 98-99% (per kg) | 130.00 |
| Pure Para Cresol 96% (per kg) | 86.00 |
| Meta Para Cresol 42% (per kg) | 51.00 |
| Formic Acid (per kg) | 26.00 |
| Formaldehyde (per kg) | 8.00 |
| Glue Flakes (per kg) | 15.00 |
| Glycerine I.W. (per kg) | 49.00 |
| Hydrosulphite of Soda (TCPL) (per kg) | 38.00 |
| Hydrosulphite of Soda (IDI) (per kg) | 42.00 |
| Hydrosulphite of Soda (BASF) (per kg) | 48.00 |
| Hexamine (per kg) | 31.00 |
| Hyflosupercell (per kg) | 24.00 |
| Hydrogen Peroxide (per kg) | 31.50 |
| Litharge (per kg) | 38.00 |
| Lead Acetate (per kg) | 38.00 |
| Magnesium Carbonate (per kg) | 16 50 |
| Magnesium Chloride (per kg) | 3.70 |
| Maleic Anhydride (per kg) | 40.00 |
| Menthol Crystals (per kg) | 370.00 |
| Oxalic Acid (per kg) | 18.00 |
| Paraffin Wax (per kg) | 18.00 |
| Potassium Bichromate (per kg) | 36.00 |
| Phosphoric Acid (per kg) | 28.00 |
| Polyvinyl Alcohol Powder (per kg) | 150.00 |
| Pentaerythritol (per kg) | 52.00 |
| Phthalic Anhydride (per kg) | 30.00 |
| Soda Ash (TAC) (per 75 kgs) | 410.00 |
| Soda Ash (TATA) (per 75 kgs) | 410.00 |
| Sodium Bicarbonate (TATA) (per 50 kgs) | 380.00 |
| Sodium Silicate (per MT) | 3,750.00 |
| Sodium Bichromate (per kg) | 28.00 |
| Sodium Nitrate (per kg) | 8.00 |
| Sodium Nitrite (per kg) | 25.00 |
| Sodium Sulphide Flakes (per kg) | 20.00 |
| Sodium Bisulphite (per kg) | 8.00 |
| Sodium Alginate (per kg) | 290.00 |
| Sodium Acetate (per kg) | 7.50 |
| Sodium Sulphate (Anhydrous) (per kg) | 3.75 |
| Titanium Dioxide (Anatase) (per kg) | 62.00 |
| Titanium Dioxide (Rutile) (per kg) | 80.00 |
| Trisodium Phosphate (per kg) | 10.00 |
| Urea (Technical) (per kg) | 3.00 |
| Zinc Oxide (per kg) | 50.00 |
| Zinc Chloride Powder (per kg) | 14.00 |
| Zinc Sulphate (per kg) | 8.00 |

### SOLVENTS

| | |
|---|---|
| Acetone -- HOCL (per kg) | 18.50 |
| Butanol (per kg) | 36.00 |
| Butyl Acetate (per kg) | 42.00 |
| Benzene (per lit) | 14.00 |
| Cellosolve (per kg) | 65.00 |
| Carbon Tetra Chloride (per kg) | 22.00 |
| Chloroform (per kg) | 28.50 |
| Diacetone Alcohol (per kg) | 30.00 |
| Diethylene Glycol (per kg) | 30.00 |
| Dichloroethane (per kg) | 18.00 |
| Di-octyl Phthalate (per kg) | 46.00 |
| Di-N-butyl Phthalate (per kg) | 46.00 |
| Ethyl Acetate (per kg) | 18.00 |
| Isopropyl Alcohol (per kg) | 28 75 |
| Methanol (per kg) | 10 00 |
| Methylene Chloride (per kg) | 22.00 |
| Methyl Ethyl Ketone (per kg) | 30 00 |
| Methyl Isobutyl Ketone (per kg) | 41 00 |
| Phenol (per kg) | 38 00 |
| Sorbitol (per kg) | 15 00 |
| Triethanolamine (per kg) | 90 00 |
| Trichloroethylene (per kg) | 26 00 |
| 1-1-1 Trichloroethane (per kg) | 29 00 |
| Turpentine (per lit) | 16 00 |
| Toluene (per lit) | 14 00 |
| Xylene (per lit) | 22 00 |

# International Bulk Chemical Prices

## SPOT PRICES AS ON 11th JULY 1990

| Product | European Spot Price range ($/ton) | US Price Range ($/ton) |
|---|---|---|
| Ethylene (delivered) | 600-730 (cif) | 507 |
| Propylene | 395-510 (cif) | 341-386 (spot) |
| Butadiene | 450-500 (fob) | 595 |
| Benzene | 410-420 (fob) | 411 (spot) |
| Toluene | 340-345 (fob) | 350 (spot) |
| Xylenes (virgin) | 325-330 (fob) | 334-340 (spot) |
| (solvent) | 325-330 (fob) | n.a. |
| Styrene | 1100-1150 (T2) (fob)<br>1100-1150 (T1) (cif) | 1100-1170 (spot) |
| Paraxylene | 365-370 (fob) | n.a. |
| Orthoxylene | 368-372 (fob) | n.a. |
| Ammonia | 120-130 (cif) | n.a. |
| Methanol | 123-125 (T2) (fob)<br>102-104 (T1) (cif) | n.a. |
| Naphtha | 158-160 (cif) | |

# Shipping News

## VESSELS DUE IN BOMBAY FOR EXPORT LOADING

| Due Date (1) | Steamer's Name & Flag (2) | Agents (3) | Will load for (4) | Approx. sailing dt. (5) |
|---|---|---|---|---|
| 12/8 | CMB Mover (Nhava Sheva) | C.M.B. | Norfolk; New York; Baltimore; Philadelphia; Charleston; Savannah; Houston; Miami; New Orleans via Antwerp; Montreal; Toronto; Halifax. (Carting at Kalamboli). | 14/8 |
| 10/8 | Buzet | Oceanic | New York; Baltimore; Phialdelphia; Chicago; Boston; Norfolk; Atlanta; Charleston; Savannah; Miami; Houston & other inland destinations in U.S. East Coast and S. American ports. (Carting at Wadi Bunder No. 3) | 14/8 |
| 10/8 | Eagle Nova (Voy-039) | F.F.C. Co. | Los Angeles (Harbour); Longbeach; San Francisco; Oakland; Seattle; Vancouver (B.C.); Portland; New York; Boston; Norfolk; Baltimore; Charleston; Savannah; Miami; New Orleans; Houston; Montreal; Toronto; Fortworth; Chicago; Nashville; Atlanta; Philadelphia; Milwaukee; Kansas City; Phoenix; Guam; Dallas; Cleveland; St. Louis; Cincinnati; Denver; Louisville; Memphis; Wilmington (B.C.); San Diego; Minneapolis; Indianapolis and Central American Ports; Honolulu. (Carting at Timber Pond No. 1). | 16/8 |
| 11/8 | Mulbera | Killick | S. American Ports.,(Carting at Hay Bunder No. 5). | 15/8 |
| 16/8 | Kapitan Kud | Marathon | Boston; New York; Baltimore; Norfolk. (Carting at TP. No. 3). | 18/8 |
| 12/8 | CMB Mover (Nhava Sheva) | C.M.B. | Lagos; Abidjan; Lome; Douala; Matadi; Port Gentil; Pointe Noire; Nouakchott; Cotonou; Dakar; Luanda; Monrovia; Tema; via Antwerp. (Carting at Kalamboli). | 14/8 |
| Stream | Ramses II (Egy) | M.C.S. | Jeddah; P. Said; P. Suez; Alexandria. | 16/8 |
| Stream | Berezovka (Rus) | Transocean | Aden; Jeddah; Odea. | 22/8 |
| 6/8 | Volosko (Yug) | Oceanic | Jeddah; P. Said; Rijeka. | 16/8 |
| 12/8 | CMB Mover | C.M.B. Merzario | Port Sudan; Jeddah; La Spezia; Valencia; Genoa; Barcelona; Marseilles; Tunis; Casablanca; Tangier; Alexandria; Piraeus; Mersin; Limassol; Felixstowe; London; Liverpool; Manchester; Birmingham; Avonmouth; Dublin and all inland destinations in U.K.; Antwerp; Rotterdam; Hamburg; Bremen; Leixoes; Lisbon; Copenhagen; Oslo; Gothenburg; Stockholm; Malmao; Aarhus; Helsinki. (Crtg. at Kalamboli for both). | 14/8 |
| 10/8 | Buzet (Yug) | Oceanic/ L. Triest | P. Said; (LCL also) Rijeka; Med. Ports. (Carting at Wadi Bunder No. 3) Trieste; Venice; Ravennah; Rijeka; Ancona. (Carting at M-171/173 Cotton Depot). | 14/8 |

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| 10/8 | Eagle Nova | F.F.C. Co. | Jeddah; P. Sudan; Hodeidah. (Carting at Timber Pond No. 1). | 16/8 |
| 16/8 | Brest (N.S.) | Transocean | Odessa; Illyichevsk; Havana; (Cuba); Genoa; Trieste; Piraeus; Marseilles; Barcelona; Varna; Bourgas. (Carting at Kalamboli). | 18/8 |
| 12/8 | Birgit Naber (Ger) | Samrat/ Hindustan/ | Felixstowe; Hamburg; Rotterdam; Also London; Liverpool; Leixoes; Lisbon; Manchester; Avonmouth; Wembly; Birmingham; Leicester; Le Havre; Bremen; Amsterdam; Antwerp; Copenhagen; Leeds; Aarhus; Gothenburg; Oslo; Helsinki; Stockholm; Belfast and all destination in U.K.; Benelux; Germany; Italy; France; Switzerland and Austria. (Carting at M.O.D. No. 1 for both). | 18/8 |
| | | Killick | Felixstowe; Rotterdam; Hamburg; Antwerp; Le Havre; Lisbon; Leixoes; London; Liverpool; Manchester; Bristol; Avonmouth; Leeds: Glasgow; Tilbury; Birmingham; Dublin; Belfast; Bremen; Bremerhaven; Aarhus; Copenhagen; Gothenburg; Helsinborg; Oslo; Helsinki; Alexandria; Latakia; Mersin; Malta; Limmassol; Piraeus. (Carting at E-Shed Grain Depot). | |
| 15/8 | Yulius Fuchik (Rus) (V-111 W/B) | Transocean | Odessa; Izmail; Reni (U.S.S.R.); Russe; Bulgaria; Budapest (Hungary); Linz; Vienna (Austria); Bratislava (Czechoslovakia); Deggendorff; Regensborg (West Germany). (All ports on River Danube). (Carting at NO-PD & G-PD). | 16/8 |
| 16/8 | Kapitan Kud (Rus) | Transocean/ | Tilbury; Avonmouth; Liverpool; Manchester; London; Felixstowe; Birmingham; Antwerp; (Rotterdam); Hamburg; Bremen; Copenhagen; Gothenburg; Oslo; Stockholm; Malmao; Leeds. (Carting at TP No. 3). | 18/8 |
| | | I.S.S. Co. | Felixstowe; Tilbury; Antwerp; Rotterdam; Hamburg; Bremerhaven; & Scandinavian Ports via Hamburg. (Carting at E-Grain Depot). | |
| Stream | Ramses II | M.C.S. | Karachi (Afghanistan). | 16/8 |
| 10/8 | Eagle Nova | F.F.C. Co. | Colombo; Rangoon. (Carting at Timber Pond No. 1). | 16/8 |
| 10/8 | Samudra Samrat | J.M. Baxi | Karachi (Afghanistan); Chittagong. | 16/8 |
| 16/8 | Brest (N.S.) | Transocean | Afghanistan. (Carting at Kalamboli). | 18/8 |
| 8/8 | Zinoviv Solovyev | Transocean | Singapore; Main Japan Ports. | 17/8 |
| 10/8 | Eagle Nova (V-018) (Ger) | F.F.C. Co. | Penang; P. Kelang; Singapore; Bangkok; Jakarta; (T. Priok); Hongkong; Manila; Busan; Keelung; Kaohsiung; Kobe; Yokohama; Nagoya; Osaka; Tokyo; Tsingtao; Dairen; Quangzhou; Whampoa; Shangai; Hsingkang. (Carting at Timber Pond No. 1). | 16/8 |
| 11/8 | Mulbera | I.M.E./Killick/ P&O | Singapore. (Carting at H.B. No. 5 for Killick). (Carting at T.P. No. 4 for P&O). (Carting at W.B. No. 3 for I.M.E.). | 15/8 |
| 10/8 | Eagle Nova | F.F.C. Co. | Brisbane; Fremantle; Sydney; Melbourne; Adelaide. (Crtg. at T.P. No. 1). | 16/8 |
| 11/8 | Mulbera (Sing) | Killick/ P&O | Melbourne; Sydney; Brisbane; Adelaide; Fremantle; P. Hobart; Devon. P; Launceston; Burnie; New Plymouth; Auckland; Wellington; Lyttelton; P. Chalmers; Christchurch; Dunedin; Napier. Also Western Samoa; Papua; New Guinea; Solomon Island; American Samoa; Tonga; New Calidonia; P. Villa. (Carting at H.B. No. 5 for Killick) (Carting at T.P. No. 4 for P&O). | 15/8 |
| | | I.M.E. | Sydney; Melbourne; Adelaide; Fremantle; Brisbane; Auckland; Wellington; Lyttelton. (Carting at W.B. No. 3). | |
| 10/8 | Eagle Nova (V-018) | F.F.C. C. | Dubai; Sharjah; Abu Dhabi; Doha; Muscat; Dammam; Riyadh; Bahrain; Kuwait. (Carting at Timber Pond No. 1). | 16/8 |
| 12/8 | CMB Move. | CMB/ Merzario | Dubai; Abu Dhabi; Bahrain; Kuwait; Dammam; Doha. (Carting at Kalamboli for both). | 14/8 |
| 14/8 | Lanka Mahapola (Sri L.) (Voy-96) | Seahorse | Dubai; Sharjah; Muscat; Dammam; Riyadh; Kuwait; Salallah; Doha; Abu Dhabi; Bahrain. (Carting at M.O.D. No. 3). | 16/8 |
| 12/8 | CMB Mover (Nhava Sheva) | C.M.B. | Dar Es Salaam; Mombasa (Direct); Nacala; Tanga; Kampala; Blantyre; Lusaka; Ndola; Matwara; Lilongwe and all Inland destinations in East Africa. (Carting at Kalamoboli). | 14/8 |

## VESSELS DUE FOR IMPORT DISCHARGE

| Due Date | Steamer's Name | Agents | From |
|---|---|---|---|
| 16/8 | Brest (N.S.) | Transocean | Med./Gulf & Odessa |
| 17/8 | Daryalok | S.C.I. | Japan/F. East |
| 16/8 | Kapitan Kud | Transocean | U.K. Cont. |
| 15/8 | Putvil | Transocean | Far East |
| 15/8 | Tabuk | Transworld | S. America |
| 22/8 | Vishva Parag | S.C.I. | U.K. Cont. |
| 15/8 | Vishva Prafulla | S.C.I. | U.K. Cont. |
| 15/8 | Yulius Fuchik (V-111) | Transocean | Russia/E. Europe |

- **JAKROVAT (VAT) MICROFIX PASTE**
- **JAKRO PRINT (PIGMENT) EMULSIONS**

Excellent Colours for Quality Textile Printing

*MANUFACTURERS:*

**J.K. ENTERPRISE**

**Regd. Off.:** 2210/103/A, Agarwal Market, Katra Tabacco, Delhi 110 006. (India)
**Phones: Off.: 2929230/232, 2917045; Resi.: 7125360, 7118671**

*Associates:*
**JAY KAY DYES & CHEMICALS**
**PARKASH DYE CHEM**

CONTACT FOR YOUR PACKING PROBLEMS

**Available Regularly At Most Competitive Rates in any QUANTITIES**

**SECOND-HAND/ONCE USED, H.D.P.E. JERRYCANS CARBOYS AND BARRELS**

**OF VARIOUS QUALITY AND ALSO IMPORTED SIZE AVAILABLE**

**(Narrow mouth): 20, 30, 50 (Rocket type) and 100 Kg. capacity**
**(Wide mouth): 50, 80 and 200 (Blue) Kg. capacity**

**We are also interested in disposable carboys**

Write to

**BOX NO. 1260**

**CHEMICAL WEEKLY**
306, Shri Hanuman Industrial Estate, G.D. Ambekar Road, Wadala, Bombay 400 031.

**"REQUIRED FOR"**

**A CHEMICAL PLANT AT AHMEDABAD**

To Manufacture

**ETHYL ACETATE**

**for Drugs, Paints & Lacquer industry**

**Erection of plant nearing completion; Will go on stream shortly.**

Requires **CONSULTANT/CHEMIST**

**Person having extensive experience in the same field may contact:**

**THE MANAGER**

**BHARAT CHEMICALS**

'Nilkanth', Near Underbridge Corner, Shahibaug, Ahmedabad 380 004. **Tel. No.: 67879**

For Regular Requirement,

NOTE: TRADE INQUIRY ACCEPTED

# Materials Imported/Exported

## MATERIALS IMPORTED BOMBAY

### (From 17.4.90 to 30.4.90)

(Continued from previous issue)

EPICHLOROHYDRIN: From Japan: Cibatul Ltd., 47,250 Kgs., Rs. 10,78,078; Hasmukhray & Co., 6.48 Mts., Rs. 1,58,319; Tata Exports Ltd., 15,840 Kgs., Rs. 3,87,002; Jay International, 15,608 Kgs., Rs. 3,75,462.

2-ETHYL ANTHRAQUINONE: From Japan: National Peroxide Ltd., 2,500 Kgs., Rs. 6,91,957.

ETHYL HEXANOIC ACID: From Sweden: Alpha Chemie, 14,820 Kgs., Rs. 2,56, 574.

2-ETHYL HEXYL TRIMELLITATE: From USA: Finolex Cables Ltd., 14.832 Mts., Rs. 4,65,911.

ETHYL MERCAPTONE: From Netherlands: Pesticides India, 12,480 Kgs., Rs. 3,19,068.

ETHYL VANILLIN: From France: Quest International, 500 Kgs., Rs. 2,28,613.

FERRIC OXIDE: From Japan: Cosmo Ferrites Ltd., 36,000 Kgs., Rs. 3,66,072.

FURFURYLAMINE: From France: Hoechst India Ltd., 3,080 Kgs., Rs. 3,25,641.

GUIACOL: From Japan: Camphor & Allied Products, 3,000 Kgs., Rs. 2,99,132.

GUM ROSIN: From Indonesia: Twin-city Organics Pvt. Ltd., 13.5 Mts., Rs. 1,26,895.

GUM ROSIN N GRADE: From China: Union Phosphates & Chemicals, 54,000 Kgs., Rs. 4,74,405; From Hong Kong: Sigma Paints Ltd., 17.550 Mts., Rs. 1,57,730.

GUM ROSIN WW GRADE: From Indonesia: Shree Vindhya Paper Mills Ltd., 18 Mts., Rs. 1,60,204.

HEDIONE: From Switzerland: Tata Oil Mills Co. Ltd., 250 Kgs., Rs. 1,11,872.

HEXA CHLORO CYCLOPENTADIENE: From USA: Bharat Pulverising Mills Limited, 17.781 Mts., Rs. 5,67,855.

HEPTACHLOR TECH 72%: From USA: Pesticides India, 15,840 lbs., Rs. 6,56,934.

HYDRAZINE HYDRATE: From China: Dyes Ditributors (I) Ltd., 8,000 Kgs., Rs. 2,20,051; Sunder's Distribution India, 8 Mts., Rs. 2,20,851.

HYDRAZINE HYDRATE 60% MIN: From China: Gupta Trading Co., 24 Mts., Rs. 4,09,257.

HYDRAZINE HYDRATE 200%: From Japan: Hindustan Ciba Geigy Ltd., 2,000 Kgs., Rs. 90,747.

HYDROQUINONE: From France: May & Bayer (I) Ltd., 8,000 Kgs., Rs. 4,88,639.

HYDROXY QUINOLINE : From France: Eskay Fine Chemicals, 1,500 Kgs., Rs. 3,55,321.

8-HYDROXY QUINOLINE: From Japan: Kirti Chemicals, 1,000 Kgs., Rs. 2,10,636; From Singapore: Mehta Pharm Inds., 465 Mts., Rs. 88,871.

IODINE CRUDE: From China: Atul Products Ltd., 5,400 Kgs., Rs. 16,30,320; From Japan: Kirti Chemicals, 2,000 Kgs., Rs. 5,87,414.

IODINE CRUDE 99.5% MIN: From Japan: Lub Chem, 2,000 Kgs., Rs. 2,95,698.

ISO BORNYL METHOXY CYCLOHEXANOL: From Japan: Industrial Perfumeries Ltd., 24.54 Kgs., Rs. 1,06,759.

MARK OF QUALITY
NOW AVAILABLE IN ANY QUANTITY
AS AND WHEN REQUIRED BY YOU

BENZYL CHLORIDE
BENZO TRI CHLORIDE
BENZOYL CHLORIDE
BENZALDEHYDE

GWALIOR CHEMICALS PVT. LTD.

Factory:
Birlagram
NAGDA - 456 331
(M.P.)
Phone: 283/104

Regd. Office:
29, Bank Street 1st Floor,
BOMBAY 400 023.
Phone: 2862453/2863021
Gram: "METALDIST"
Telex: 011-6554 MINA IN.

ISO CYANATE VM 25: From UK: LML Ltd., 6.525 Mts., Rs. 2,64,738.

ISODECYL DI PHENYL PHOSPHATE: From UK: Moti Electric Inds., 5.06 Mts., Rs. 2,47,629.

ISOPHTHALIC ACID: From USA: Parikh Chemical Industries, 3 Mts., Rs. 55,967.

ISOPROPYL ALCOHOL: From Taiwan: S.D. Fine Chem Ltd., 12,600 Kgs., Rs. 1,55,248.

LITHIUM HYDROXIDE MONO HYDRATE: From USA: Yale Intl. Impex Pvt. Ltd., 3,000 lbs., Rs. 1,09,158.

2,6 LUTIDINE: From Japan: Armour Chemicals Ltd., 1,080 Kgs., Rs. 2,45,018; Ranbaxy Labs Ltd., 555 Kgs., Rs. 1,28,334.

DL MALIC ACID: From Japan: Pioma Industries, 17.5 Mts., Rs. 4,05,174.

MERCURY (VIRGIN): From Japan: L.S. Chemicals & Pharmaceuticals, 100 Nos., Rs. 4,26,674.

MERCURY 99.9% MIN: From Netherlands: IDI 50 nos., Rs. 2,12,767.

META CRESOL 98% MIN: From Japan: Hickson & Dadajee Ltd., 16,000 Kgs., Rs. 6,42,212.

DL METHIONINE FEED GRADE: From France: Bombay Pharma Products, 2,500 Kgs., Rs. 1,11,745.

METHOXY PROPYLAMINE: From USA: IDI, 3.045 Mts., Rs. 1,56,999.

METHYL CHLORO FORMATE: From USA: Cipla Ltd., 593 Mts., Rs. 1,60,335.

2-METHYL-5 ETHYL PYRIDINE: From Switzerland: Roche Products Ltd., 900 Kgs., Rs. 99,135.

2-2 METHYLENE BIS (4 METHYL 6 TERT. BUTYL PHENOL): From FRG: ABS Plastics Ltd., 3 Mts., Rs. 3,01,668.

FILTER CLOTHS
FILTER CLOTHS

In Cotton. Nylon. Acrylic polyester Fibre polypropylene. P.V.A.. P.V.C. are manufactured in over 400 Varieties and also Supplied as per your specifications and requirements. prices are competitive.
Our full-fledged technical department is ready to assist you.

Please contact for further details and sample.

BHARAT INDUSTRIAL CORPORATION
TELEX: 011-72262 DRAG IN.
90, BHAJIPALA LANE TAVAWALA, BLDG. BOMBAY 400 003.
GRAM: "BHARATTUBE", BOMBAY - 400 003.
PHONE: 341920, 341869, 335759 ■ RESI.: 5134142

MOLYBDENUM TRIOXIDE: From Japan: Sudharshan Chem Inds., 3,000 Kgs., Rs. 3,75,622.

MONOMETHYL ACETO ACETAMIDE: From FRG: Vantech Pesticidies Ltd., 15.96 Mts., Rs. 4,45,639.

MONOMETHYL ACETO ACETAMIDE 70%: From FRG: Hindustan Ciba Geigy Ltd., 1,890 Kgs., Rs. 52,773.04.

MONO OCTYL TIN OXIDE: From Japan: Sun Chemicals, 2,000 Kgs., Rs. 4,08,004.

4 NITRO 2 AMINOPHENOL: From Japan : BASF India Ltd., 400 Kgs., Rs. 69,800.

PARA CHLORO META CRESOL: From FRG: BASF India Ltd., 1,000 Kgs., Rs. 1,55,033.

PARAFORMALDEHYDE 96%: From Spain: D. Jamnadas & Co., 18 Mts., Rs. 1,50,231; K.D. Shanghvi & Co., 18,000 Kgs., Rs. 1,47,916.

PARA HYDROXYL PHENYL ACETAMIDE: From Japan: Win Labs., 120 Kgs., Rs. 7,87,424.

PEPSIN: From USA: Rathi Papains Pvt. Ltd., 4,000 Kgs., Rs. 4,46,656.

PERCHLOROETHYLENE: From Spain: Speciality Chemicals, 19.22 Mts., Rs. 1,42,552.

PIVOLOYL CHLORIDE: From USA: Armour Chemicals Ltd., 7,000 Kgs., Rs. 4,71,537.

POLYVINYL ALCOHOL: From Japan: Synthetic & Polymer Inds., 500 Kgs., Rs. 1,96,328.

POLYVINYL PYRROLIDONE: From FRG: From FRG: Cadilla Antibiotics, 500 Kgs., Rs. 1,23,972.

PROPIONIC ANHYDRIDE: From Japan: Jaysynth Dyechem Ltd., 6,120 Kgs., Rs. 2,60,116.

SODIUM FORMATE: From Japan: R.K. Chemicals, 40 Mts., Rs. 1,36,122.

SODIUM METHOXIDE: From FRG: Industrial Perfumes Ltd., 1,000

Kgs., Rs. 64,263.

TETRAHYDROFURAN: From FRG: Prakash Pipes & Inds. Ltd., 28,392 Kgs., Rs. 13,47,707.

THEOPHYTHINE: From Cnina : Alaragency, 625 Kgs., Rs. 98,164.

THEOPHYLLINE ANHYDROUS: From China: Cipla Ltd., 2,000 Kgs., Rs. 3,21,106.

THIOPHENOL: From Japan: Transchem Pvt. Ltd., 1,000 Kgs., Rs. 97,708.

TITANIUM DIOXIDE: From China: Popular Chemical Co., 21.5 Mts., Rs. 4,21,452; From Japan: Asian Paints (I) Ltd., 51,000 Kgs., Rs. 23,58,557.

TITANIUM DIOXIDE RUTILE RR 2: From Finland: Goodlass Nerolac Paints Ltd., 80 Mts., Rs. 37,79,504.

TITANIUM DIOXIDE R-900: From USA: Jalgaon Pipes Mfg. Co. Pvt. Ltd., 15 Mts., Rs. 6,67,316.

TITANIUM DIOXIDE R-902: From USA: Jain Accessories & Fittings, 15 Mts., Rs. 6,67,516; Jain Compounding & Formulation, 15 Mts., Rs. 6,67,516.

TOLUENE DI ISOCYANATE: From USA: Banmore Foam Pvt. Ltd., 15,974 Kgs., Rs. 5,63,127.

3,4,5 TRIMETHOXY BENZALDEHYDE: From Japan: IPCA Labs., 1770 Kgs., Rs. 7,12,704; New Generic Drug House, 2000 Kgs., Rs. 7,62,936.

TRIMETHYL PHOSPHITE: From USA: Vantech Pesticides Ltd., 31,026 Kgs., Rs. 12,99,478.

TUNGSTEN CARBIDE POWDER: From FRG: Drillco Metal Carbides Ltd., 300 Kgs., Rs. 1,31,966; Sandvik Asia Ltd., 10.5 Kgs., Rs. 1,87,310.

---

## MATERIALS IMPORTED MADRAS (From 17.4.90 to 30.4.90)

---

ACETONE: From China: ICI India Ltd., 25,600 Kgs., Rs. 3,44,002.

ACETYL CHLORIDE: From France: Sumitra Pharmaceuticals, 28,000 Kgs., Rs. 6,83,537; From Netherlands: Shasun Drugs, 14.06 Mts., Rs. 3,96,267.

ACETYLENE BLACK: From Singapore: Union Carbide India Ltd., 9 Mts., Rs. 2,68,322.

N-ACETYL SULPHANILYL CHLORIDE: From Japan: Standard Organics Ltd., 20 Mts., Rs. 8,54,529.

ACRYLAMIDE: From Japan: Tushar Enterprises, 30,000 Kgs., Rs. 4,71,188.

ALUMINIUM OXIDE: From Hong Kong: Carborundum Universal Ltd., 20 Mts., Rs. 1,88,476.

ALUMINIUM OXIDE WHITE: From FRG: Carborundum Universal Ltd., 20 Mts., Rs. 4,11,285.

ANTI OXIDANT: From Japan: Superfil Products Pvt. Ltd., 1,020 Kgs., Rs. 3,25,146.

AROMATIC CHEMICALS: From France: Mudanna & Sons, 5 Kgs., Rs. 13,802; From USA: Metro Agarbathi Ltd., 15,014.16 Kgs., Rs. 8,64,660.

BUTACHLOR TECHNICAL: From USA: GACL, 31,655.44 Kgs., Rs. 13,40,688; Tropical Agrosystems, 15,872.72 Kgs., Rs. 6,70,344; Tropical Agrosystems, 15,872.72 Kgs., Rs. 6,70,344; Gujarat Inds., 15,872 Kgs., Rs. 6,70,344; Tropical Agro Systems 69,840 Kgs., Rs. 13,40,688.

N-BUTANOL: From China: Siris Ltd., 105.6 Mts., Rs. 13,91,366.

BUTYLATED HYDROXY/ANISOLE BP G: From Japan: Blue Pharmaceuticals, 500 Kgs., Rs. 55,408.

CAPROIC ACID: From Japan: Reckitt & Colman of India Ltd., 1,080 Kgs., Rs. 36,239.

CARBON BLACK: From Korea: Vikrant Tyres Ltd., 1,49,000 Kgs., Rs. 16,59,454; From USA: Premier Tyres Ltd., 72,576 Kgs., Rs. 9,24,584.

Available
META CHLORO ANILINE
(Minimum Purity 99%)
For Local and Export
For further details please contact:
Valiant Chemical Corporation

For Local:
Mr. Arvind Chheda/Mr. H.L. Gala
5, Chheda Bhavan, 98, Surat Street,
Bombay-400 009.
Phone: 863618, 862620, 8550245, 8555639, 8511698

For Export:
Mr. Manoj Chheda/Mr. Mahesh Vikam
Plot No. 74, Matru Smriti, Road No. 4,
Scheme No. 6, Sion (East), Bombay-400 022.
Phone: 4072435, 4077431, 4077432, 4077433
Telex : 011-73254 ALAB IN
Fax : 022-4075524

CETO STEARYL ALCOHOL: From FRG: Kanchan Agencies, 7,540 Kgs., Rs. 1,93,164.

CHLOROPROPIONIC ACID: From UK: Vorin Labs Pvt. Ltd., 20. Mts., Rs. 4,18,278.

CITRIC ACID MONOHYDRATE BP: From Hong Kong: Kothari Phyto Chemicals Intl, 19,950 Kgs., Rs. 2,95,932.

CORN STARCH: From Singapore: Kemwell International Pvt. Ltd., 1995 Kgs., N.A.

4-CYANOPYRIDINE: From Japan: Chandak Labs Pvt. Ltd., 10,000 Kgs., Rs. 8,60,254.

D E A AMINE: From Japan: K.K. International, 60,340 Kgs., Rs. 7,73,968.

DICHLORONITROPHENOL: From UK: ICI India Ltd., 3,053 Kgs., Rs. 6,75,939.

DIMETHYL ACETAMIDE: From China: T.T.K. Pharma Ltd., 1,140 Kgs.. Rs. 42,302.

DIMETHYL BENZYL CARBINYL ACETATE: From Sweden: N. Ranga Rao & Sons., 275 Kgs., Rs. 55,354.

DIMETHYL FORMAMIDE: From Japan: Cheminor Drugs Ltd., 15,200 Kgs., Rs. 2,38,794; Reckitt and Colman of India, 5,130 Kgs., Rs. 90,868.

DIMETHYL SULPHOXIDE: From France: Globe Organics Ltd., 50,400 Kgs., Rs. 14,07,281; From Japan: Inventaa Chemicals, 6,820 Kgs., Rs. 1,70,611; Plant Organics Ltd., 15,840 Kgs., Rs. 4,21,842.

DIPHENYL METHANE DI ISO CYANATE: From FRG: Urethanes India Ltd., 15,750 Kgs., Rs. 7,28,378.

DIMETHYL TIN OXIDE (DMTO): From Japan: Chemidye Mfg. Co. Pvt Ltd., 50 Kgs., Rs. 55,342.

AMMONIUM NITRATE (RCF Melt)
AMMONIUM MOLYBDATE
CALCIUM NITRATE
CALCIUM STEARATE
COBALT SULPHATE
MAGNESIUM NITRATE
MAGNESIUM OXIDE
POTASSIUM BROMATE
POTASSIUM IODIDE/IODATE
SODIUM MOLYBDATE

YOGI
DYE CHEM
INDUSTRIES

463, 'YOGESHWAR', 135, KAZI SYED STREET, BOMBAY-3.
TEL. : 326642-331195 RES. 5135908, GRAM : SULPHATES

L-EPHEDRINE HCL BP: From Hong Kong: Ranka Pharmaceuticals Pvt. Ltd.,10 nos., Rs. 2,54,922.

EPICHLOROHYDRIN: From Japan: Veeyor Polymers, 15,840 Kgs., Rs. 3,87,002.

EPOXY RESIN: From Japan: Electronic Research Ltd., 155 Kgs., Rs. 38,864; From Korea: Suchitra Components Ltd., 50 Kgs., Rs. 5,207; From Singapore: Indrad Auto Components, 491 Kgs., Rs. 73,492.

EPOXY RESIN HARDNER: From China: Al-Ameen Comm. & Inds. Co., 200 Kgs., Rs. 24,188.

2-ETHOXYBENZOIC ACID 98%: From UK: Amrutanjan Ltd., 1,075 Kgs., Rs. 8,506.

ETHYL CYANOACRYLATE: From FRG: Darien Electric, 33.25 Kgs., Rs. 29,038

N-N ETHYLENE BIS (OLEAMIDE): From Belgium: Urethanes India Ltd., 298 Kgs., Rs. 25,757.

FRUCTOSE SYRUP: From Malaysia: Usha Biotech Inds. Ltd., 10 Kgs., Rs. 360.

GUM BENZOIN: From Indonesia: Ashwatiah & Bros., 200 Kgs., Rs. 30,098; From Malaysia: Stevi International, 100 Kgs., Rs. 17,452; From Singapore: Arvind & Co., 1,555 Kgs., Rs. 21,202; Sanghvi Bhoormal Chunilal, 3,978 Kgs., Rs. 54,240; From Singapore: Pravin & Co., 2,046 Kgs., Rs. 27,897.

GUM ROSIN WW GRADE: From Indonesia: Reichold Chemicals, 36,000 Kgs., Rs. 3,18,838; TN Newsprint Paper Ltd., 72 Mts., Rs. 6,35,210; From Singapore: Andhra Pradesh Paper Mills Ltd., 200 Mts., Rs. 18,83,758.

GUM ROSIN: From Singapore: Raghavendra Soapnut Works, 4750 Kgs., Rs. 47,357.

GLYCERINE: From FRG: Khoday Inds., 10,000 Kgs., Rs. 3,46,449.

GLYCERYL MONOSTEARATE: From Japan: Litelon Ltd., 1.5 Mts., Rs. 1,09,944.

GUANYL THIOUREA: From Japan: Globe Organics Ltd., 2,000 Kgs., Rs. 5,52,536.

HYDROXYLAMINE SULPHATE: From USA: Dolphin Drugs Pvt. Ltd., 32 Mts., Rs. 8,27,668; SOL Pharmaceuticals Ltd., 32,000 Kgs., Rs. 7,84,616.

HYDROXYQUINOLINE: From France: Vetcare Marketing Pvt. Ltd., 1,000 Kgs., Rs. 2,50,388.

ISO BORNYL CYCLO HEXANOL: From Japan: Karnataka Soaps & Detergents, 1000 Kgs., Rs. 1,97,854.

ISO BUTYL BENZENE: From UK: Sumitra Pharmaceuticals & Chemicals, 13,600 Kgs., Rs. 7,57,268.

ISO EUGENOL: From Singapore: N. Ranga Rao & Sons, 200 Kgs., Rs. 31,804.

ISO PROPYL ALCOHOL: From China: Micropack Ltd., 40 Ltrs., Rs. 8,342; Priya Chemicals, 12,000 Kgs., Rs. 1,58,599; Shasun Drugs, 12,000 Kgs., Rs. 1,57,035; Cheminor Drugs Ltd., 51,200 Kgs., Rs. 6,08,929; From Singapore: Medicals Chemicals & Pharmaceuticals, 12,877 Kgs., Rs. 1,66,295.

2,6 LUTIDINE: From Japan: T.T.K. Pharma Ltd., 740 Kgs., Rs. 1,69,820.

MAGNESIUM OXIDE: From Japan: Devi Polymers Pvt. Ltd., 4,000 Kgs., Rs. 97,014.

3-MERCAPTOPROPYL TRIMETHOXY SILANE: From FRG: Anabond Silicones (P) Ltd., 10 Kgs., Rs. 11,266.

META CRESOL: From Japan: A.M. Aromatics Pvt. Ltd., 16 Mts., Rs. 7,95,784; Maschmeijer Aromatics (I) Ltd., 16 Mts., Rs. 8,37,668.

METHYL ACETO ACETATE: From Japan: Vani Chemicals & Intermediates, 16 Mts., Rs. 4,14,831.

METHYL ETHYL KETONE: From USA: Prakash Pipes & Inds. Ltd., 12,870 Kgs., Rs. 1,85,180.

2 METHYL 3 PHENYL PROPANOL: From UK: Bush Boake Allen (I) Ltd., 200 Kgs., Rs. 32,788.

MICROCRYSTALLINE WAX: From UK: MRF Ltd., 27,400 Kgs., Rs. 5,53,540.

MONOMETHYL CHLORO ACETO ACETAMIDE: From Australia: Indag Products, 20,800 Kgs., Rs. 14,89,401.

NITROMETHANE: From USA: Globe Organics Ltd., 18,329.5 Kgs., Rs. 12,99,476.

ORTHOCHLOROBENZALDEHYDE: From Japan: SOL Pharmaceuticals, 3,600 Kgs., Rs. 2,51,259.

PARA NITRO CHLORO BENZENE: From Hong Kong: Srinivasa Agro Industries, 39,250 Kgs., Rs. 10,10,327.

PENTANE: From FRG: Mc Dowell & Co., 30 Mts., Rs. 5,55,717.

PHOSPOR: From Japan: Fenovision Ltd., 400 Kgs., Rs. 1,43,616.

POLYBUTYLENE TEREPHTHALATE: From Japan: Electronic Research Ltd., 1,500 kgs., Rs. 1,20,415.

POLY CARBADIMIDE: From Belgium: Urethanes India Ltd., 70 Kgs., Rs. 70,727.

POLYCARBONATE: From Netherlands: S.S. Power Switchgear Ltd., 500 Kgs., Rs. 39,642.

PROPYLENE GLYCOL ALGINATE: From Biocra India Pvt. Ltd., 600 Kgs., Rs. 1,08,382.

PROPYLENE GLYCOL TECH: From Singapore: Naphtha Resins & Chemicals, 34,400 Kgs., Rs. 5,64,309

ROCKPHOSPHATE: From Jordon: EID Parry (I) Ltd., 2,700 Mts. Rs. 31,36,316; Kothari Indl. Corpn. 4,000 Mts., Rs. 46,00,558; Shaw Wallace & Co., 5,000 Mts., Rs. 57,76,406

SEBACIC ACID: Fom USA: Shriram Fibres, 100 Kgs., Rs. 10,056.

SODIUM BORATE: From Turkey Bansali Chemical, 75 Mts., Rs 4,40.585.

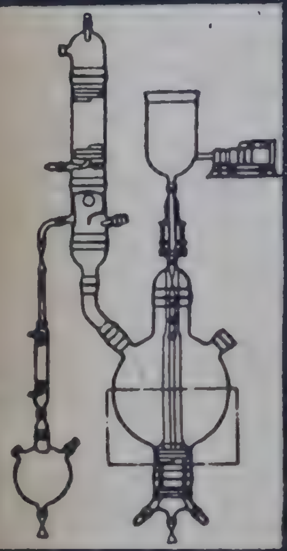
**We have regular enquiries for export of dyes to U.S.A. At present the following items are of interest to us. Manufacturers may please write to us with prices, samples and product-list at:**

**S & N VENTURES**

7, Sanjukta, S.V. Road, Bandra, Bombay 400 050.

**ACID YELLOW 73**
**ACID BLACK 5**
**ACID BLUE 45**
**ACID VIOLET 48**
**ACID YELLOW 127**
**ACID ORANGE 10**
**ACID BLUE 1**
**SOLVENT RED 68**
**ACID YELLOW 23**
**BASIC BLUE 7**
**BASIC ORANGE 21**
**DIRECT YELLOW 107**
**DIRECT BLUE 160**
**DIRECT BLACK 80**
**DIRECT BLUE 80**
**SOLVENT RED 26**
**DISPERSE BLUE 3**
**DISPERSE BLUE 26**
**DISPERSE RED 60**
**REACTIVE BLUE 19**
**REACTIVE ORANGE 86**
**REACTIVE BLUE 140**
**SOLVENT YELLOW 42**
**1,12 BENZO PERYLENE**

MANUFACTURERS OF INDUSTRIAL & LABORATORIES GLASSWARES



Specialists in
- 10 L To 200 L ALL GLASS REACTION & DISTILATION UNITS
- H.C.L. ABSORBERS UP TO 12" DIAMETER
- GLASS HEAT EXCHANGERS, COLUMNS, BENDS REDUCERS, REFLUXRATION HEADS UP TO 12" DIAMETER
- TEFLON VALVES & GLASS STOP COCKS
- COMPLETE STRUCTURE ERECTION & INSTALLATION OF GLASS UNITS
- LABORATORY INTERCHANGEABLE GLASS APPARTUS
- OIL BATH & WATER BATH WITH LEAK PROOF
- BOTTOM SEAL ARRANGEMENTS
- CENTRIFUGAL PUMPS

*GARG LAB GLASS INDUSTRIES*
Bombay Office
19, ANAND BHAWAN, 2ND FLOOR 17 BABU GENU ROAD PRINCESS STREET, BOMBAY-400 002
PHONE 319579 CABLE "GARGGLASS" (VAPI)
*Factory*
1/C18 TYPE, G.I.D.C., VAPI-396 195. DIST VALSAD (GUJARAT) PHONE: 765 — RES. 863

**Our Associates: G.P. INDUSTRIES**

---

FOR YOUR REGULAR REQUIREMENTS OF

**WHITE BEESWAX
YELLOW BEESWAX &
HONEY**

*PLEASE CONTACT MANUFACTURER :*

**MEHSONS CHEMICALS PVT. LTD.,**

P.O.B. No. 121
KAMLA BHAWAN, MADARI GATE,
BAREILLY 243 001 (U. P.)
PHONES : 76517, 77359, 74150, 76526
TELEX : 0577 209 ME IN
CABLE : VEGLAMUKHI - BAREILLY

---

MANUFACTURERS & REPRESENTATIVE OF INORGANIC AGRO CHEMICALS

* MANUFACTURE:
1. AMMONIUM NITRATE
2. POTASSIUM NITRATE
3. COCONUT SALT (Fert. use)

FOR MOST COMPETITIVE CIF PRICE, PROMPT & REGULAR DIRECT IMPORT FROM USA/JAPAN/GERMANY/CHINA/SPAIN/FRANCE

* STOCKISTS OF:
1. AMMONIUM BI-CARBONATE
2. BARIUM NITRATE
3. CAUSTIC SODA FLAKES/LYE
4. COPPER;SULPHATE
5. FERROUS SULPHATE
6. HYDRO
7. LITHARGE
8. METHANOL
9. METHYL AMINE
10. NITRIC ACID
11. PHENOL
12. SULPHURIC ACID
13. SODA ASH
14. SODIUM SULPHATE
15. SODIUM SULPHIDE
16. SODIUM NITRATE
17. T.G. UREA
18. TITANIUM DIOXIDE
19. TOLUENE
20. TRISODIUM PHOSPHATE
21. ZINC CHLORIDE
22. ZINC OXIXE

**THAKKER CHEMICALS & FERTILIZERS PVT. LTD.**

* **Registered Office:**
307, 'NAVJIVAN', 3rd Floor,
121/127, Kazi Sayed Street,
Bombay - 400 003.
**Tel. No. 336261/322719**
**Telex No. 11-75599 TCF IN**

* **Factory:**
Plot No. 1712, GIDC IIIrd Phase,
P.O. VAPI, (GUJ). 396 195
**Tel. No. Fact: 866 / Resi: 668.**

**M.E.K. PEROXIDE**
**BENZOYL PEROXIDE**

**QUALITY * RELIABILITY * CONSISTENCY**

Manufacturers

**ROMA CHEM INDUSTRIES**

**Regd. Office:** 22/1044, Punjabi Colony, G.T.B. Nagar, Bombay 400 037.
**Phones: 4073074/4092216/4093914 Resl.: 483095**
**Sales Office:** Municipal Building, C-1, Shop No. 2 & 3,
Near Sardar Nagar, No. 4, G.T.B. Nagar, Bombay 400 037.

**SPECIAL PRICE FOR BULK QUANTITY**

| | |
|---|---|
| Rs. 130/- | Benzyl Triethyl Ammonium Chloride |
| Rs. 225/- | Tetra Ethyl Ammonium Bromide |
| Rs. 450/- | Tetra Butyl Ammonium Bromide |
| POR | Butyl Triethyl Ammonium Bromide |
| POR | Benzyl Triethyl Ammonium Bromide |

CONTACT MANUFACTURERS & EXPORTERS

**HEM CORPORATION** Phone: 252250, 319990
7-Devkaran Mansion, 24/B-Vithaldas Road, Princess Street, Bombay 400 002.

ready stock: **BORON TRIFLUORIDE Dimethyl Etherate**

For Your Regular Requirements Of:

- GUANIDINE NITRATE
- SULPHA GUANIDINE
- SULPHA DIMIDINE
- DINITOLMIDE (D.O.T.)
- SODIUM METHOXIDE POWDER
- SODIUM METAL
- ACETONE
- BENZENE
- TOLUENE
- XYLENE
- CYCLOHEXANONE
- DICYANDIAMIDE
- EPICHLOROHYDRINE

Please Contact:

SUDHIR

**SUDHIR CHEMICAL INDUSTRIES**

208, Faiz E Qutbi, 375, Narsinatha Street, Bombay 400 009.
Tel.: 333605/343391 Resi.: 0215-681182
Telex: 011-76729 RCSC IN Gram: "SUDHICHEMI"

FOR YOUR REGULAR REQUIREMENTS OF:

**Lactic Acid I.P. (Food Grade/Ink Grade)**

Manufactured By:

**M/s. Munirabad Chemical Company,** Munirabad.

Please Contact:

SOLE SELLING AGENTS For MAHARASHTRA & GUJARAT

**M/s. AMOL CHEMICAL INDUSTRIES**

135/139, Kazi Sayed Street, Yogeshwar Building,
3rd Floor, Room No. 304,
Bombay 400 003.
Tel.: 328212 Resl.: 4308603

---

**ANISIC ALDEHYDE**

**NITROBENZENE * C.T.C. * CHLOROFORM**

**N-HEXANE * PHOSPHORIC ACID**

| | | |
|---|---|---|
| MMA Monomer | N-Butanol | I.P.A./M.E.K. |
| Cyclohexanone | Toluene | M.I.B.K. |
| Ethyl Cellosolve | Benzene | E.P. 60-80/40-60 |
| Butyl Acetate | Xylene | Trichloroethylene |
| Butyl Cellosolve | Acetone/EDC | D.O.P./D.B.P. |

**AJMERA CHEMICALS** 276/78, Samuel Street, 3rd Floor, R. No. 21, Bombay 3.
Ph.: 325756/332325 Resl.: 6825148

---

**Potash Alum - 99% Min.**

**Basic Chromium Sulphate**
**Sodium Sulphide Flakes** (Iron Free)
**Potassium Carbonate**
**Barium Carbonate/Chloride**
**Calcium Chloride**
**Potassium Bromate**
**Sodium Bromate**

**VORA CHEMI TRADE**

265, Samuel Street, Bombay 400 003.

THE IDEAL SOURCE FOR CHEMICALS

AUTHORISED DISTRIBUTORS OF GNFC:

**FORMIC ACID 85%**

AUTHORISED DISTRIBUTORS OF R.C.F.:

**SODIUM NITRATE • SODIUM NITRITE**
**AMMONIUM-BI-CARBONATE • METHANOL**

AUTHORISED DISTRIBUTORS OF GSFC:

**MEK OXIME (ANTI-SKINNING AGENT)**

DEALER OF CENTURY RAYON:

**ANHYDROUS SODIUM SULPHATE**

DEALER OF HOC:

**ACETONE**
**PHENOL**

AUTHORISED STOCKIST OF TTP:

**TITANIUM DIOXIDE**

DEALER OF STANDARD ALKALI:

**CAUSTIC SODA LYE**

*"WE ARE GROWING STRONGER WITHOUT LOOSING OUR PERSONAL TOUCH"*

POPAWALA & CO.

1502, MAKER CHAMBERS V, 221, NARIMAN POINT, BOMBAY-400 021, INDIA
CALL: 23 01 56 • 24 45 93 • 287 11 15 TELEX: 011-4164 POP IN

THE SYMBOL OF PURITY
IN INDUSTRIAL SOLVENTS
ELECTRONICS
COSMETICS
SURFACE COATING
DRUGS & PHARMACEUTICALS
NOCIL

Industrial Solvents & Chemical Company offers naked products at competitive prices ex-Thane Godown from four separate filling points. Of-course, ISC continues to supply original barrels of these NOCIL CHEMICALS: IPA-CBM, NBA, OCTANOL, Acetone, DIACETONE, DAA, MIBK, IBA, EDC, Isopropanol, Butanol, 2-Ethyl Hexanol, MEG, DEG and Polyethylene Glycol 200/300/400/600/1500, CELLOSOLVE, CARBITOL, Sanotol EAU & EGU (mixture of Polyethylene Glycol ethers)

Authorised Distributor

For Your Requirements Please Contact

*Industrial Solvents & Chemical Co.*

85, NARIMAN BHAVAN OPP. HOECHST HOUSE 227, NARIMAN POINT
BOMBAY-400 021 TEL : 2028162/2024774 GRAM : INSOCHEM

REGD. NO. TN/MS (C) 395

35th
YEAR OF
PUBLICATION

ISSN 0045/6500
R.N. NO. 1972/57

28 AUG 1990

# Chemical Weekly

VOL. XXXV AUGUST 21, 1990 NO. 50

A Symbiotic Relationship
Between
Customer and Supplier

Planning togethe
to make sure you
what you need -
the way you need

For all your Ethyleneamines requirements contact us or our Consignee Agents

**DIAMINES AND CHEMICALS LIMITED**
International Quality with Indigenous Ingenuity.

**Ahmedabad (H.O.)** : 1, National Chambers, Ashram Road, Ahmedabad - 380 009. Phone : 409626, Gram : DIAMINES.
**Baroda (Works)** : Plot No. 13, P.O. Petrofils - 391 347. Dist. Baroda. Phone : 73305/406, Gram : DIAMINES, Telex: 0175-352 DACL IN
*Bombay Office* : 85, 'C' Wing, Mittal Towers, 8th Floor, Nariman Point, Bombay 400 021. Phone : 2029507, Gram : CELAGAR.
CONSIGNEE AGENTS :
**Bombay** : C.K. Patel & Sons, Kamanwala Chambers, 3rd Floor, Sir P.M.Road, Fort, Bombay 400 001. Ph. : 2861190/2860146, Gram: FLYOFF.
**New Delhi** : Joshi Associates Pvt. Ltd., 20, Ansari Road, Near Fire Station, Darya Ganj, New Delhi 110 002 Ph. . 3263502, Tlx. No : 031-65535 JAPL IN.
**Bangalore** : Masturlal Pvt. Ltd., 7th Mile, Bannerghatta Road, Arakere Village, Bangalore 560 076. Ph. . (812) 641756/640533/640012, Gram: DAKORNATH Telex . 845-2115 FKCI
**Calcutta** : Alums and Chemicals, 28, Strand Road, 2nd Floor, Calcutta 700 001. Phone : 20-7971/20-5948. Gram CHEMCENTRE.

PHOSPHORIC ACID 85%

LIQUID BROMINE
& ITS SALTS

SODIUM TRIPOLY
PHOSPHATE

CAUSTIC SODA FLAKES

ACETONE

chemphos

101, M.G. ROAD. SHETTY HOUSE
2nd FLOOR BOMBAY: 400 023.
TEL. 273868, 274006. TLX: 011 3716 PHOS IN

Edited by R. Raghavan and published by N.R. Rajagopalan on behalf of owners, Sevak Publications, 306, Shri Hanuman Industrial Estate, Wadala, Bombay 400 031. Madras Office: Room No. 9, Wellingdon Estate, 3rd Floor, 24, Commander-in-Chief Road, Madras 600 105. Phone: C/o. 47165[illegible] and printed by N.R. Rajagopalan at Sevak Publications, 25, North [illegible] Street, Thiruvanmiyur, Madras 600 041. Phone: 419265. Registered with the Registrar of Newspapers for India vide [illegible]

SEE PAGE 39 FOR CONTENTS

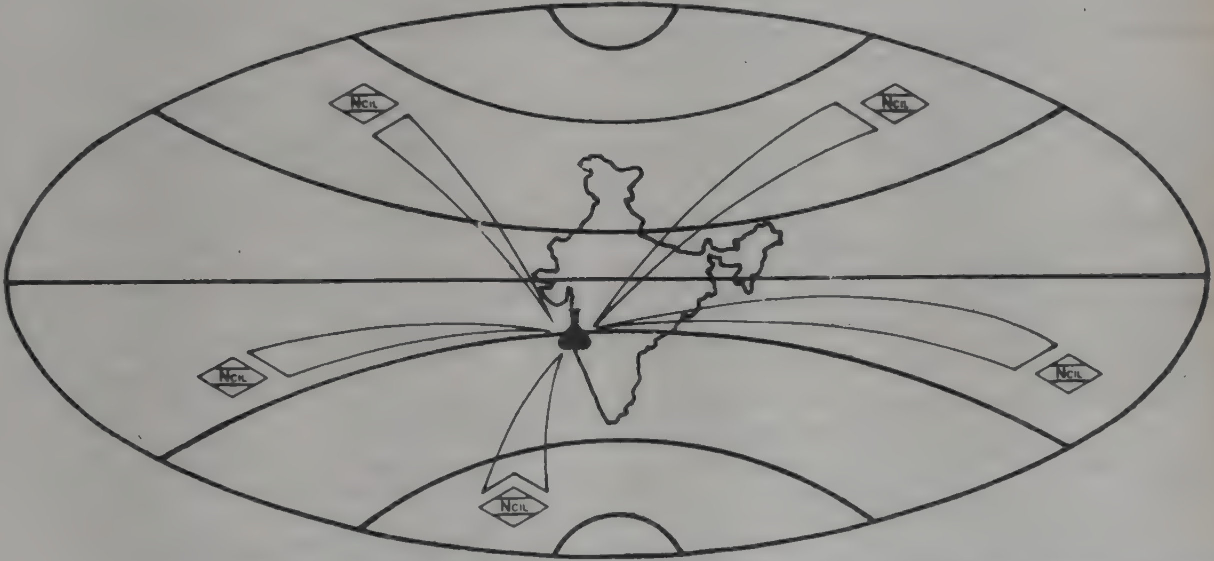
28 AUG 1990

ESTD-1964

Nukem
CORPORATION

A Household Name For Methanol, Among The Indian Industries,

**Has Now Become An International Symbol For Quality & Service**



NCIL

A Commitment to Excellence in Exports

EXPORTS:
★ Bulk Drugs & Pharmaceuticals
★ Dyes & Dyes Intermediates
★ Aromatic Oils & Preparations
★ Herbal Extracts & Preparations
★ Projects & Technology Transfer
★ Bio-Technology

IMPORTS:
☐ Pharmaceutical Raw Materials
☐ Dyes Intermediates
☐ Technology with Plants & Machinery for Import Substitutes in Chemicals & Pharmaceuticals

EXPORT PROMOTION
- Assistance to SSI & Cottage Industry for Initiation into Exports

*Contact for further details:*

NUKEM
CHEMICAL INDUSTRIES LTD.
Head Office:
Sagar Mandir, Shivaji Park, 5th Road,
Bombay-400 016 INDIA.
Telephones: 456647 ● 453096 ● 451951
468037 ● 468038
Telex : 011-71009
Gram : BROMIN KING
Fax : 00 91 (22) 468680

Please Contact for Prompt Supplies Of:

**Anhydrous Ammonia Gas**

**IN CYLINDERS AND ROAD TANKERS**

**Also Available LIQUOR AMMONIA in Carboys and Tankers**

***Surat Ammonia Supply Company***

105, Regent Towers, Race Course Circle, Baroda 390 007.
**Phones: 323827, 321897 & 320676 * Gram: SASCO * Telex: 0175-497 SASC-IN**

**Ahmedabad Office:** M.H. ENTERPRISES, Plot No. 2018, GIDC, Vatva Phase II, Ahmedabad.
**Tel. No. Office: 336279, 348873**

**Ankleshwar Office:** J-3435, G.I.D.C. Estate, Ankleshwar-393 002, Gujarat State. **Phone: 2449.**

**Hyderabad Office:** SUPERCHEM AGENCIES, Godown No. 1, Behind Bakelite Hylam, Industrial Estate, Sanathnagar, Hyderabad-500 018. **Telephone No. 263812.**

**Poona Office:** POONA GAS & CHEMICAL CO., Ratnakar, 8/16, Karve Road, Poona-411 004.
**Phones: 431110, 420330, 421695.**

**Vapi Office:** Shed No. 19, C-1, B. Type, Vapi Industrial Estate, G.I.D.C., Vapi-396 195. **Phone: 685.**

***BOMBAY AMMONIA & CHEMICAL CO.,***

204, B-Wing, Neelam Centre, 2nd Floor, Hind Cycle Road, Behind Glaxo, Worli, Bombay 400 025.
**Phones: 4948652/4948659/4949544/4946686.**

**RSG Your Local Source of Quality Chemicals**

UB PETRO PRODUCTS LTD. : **PROPYLENE GLYCOL MONO-DI & TRI**
COAL INDIA LTD. (Dankuni Coal Complex) : **CRESOLS/XYLENOLS**
ALLIED AROMATICS LTD. : **MALEIC ANHYDRIDE, FUMARIC ACID**
CARBON & CHEMICALS INDIA LTD. : **CARBON BLACK**
BINDAL INDUSTRIES : **HYDRATED LIME**
POLYCHEM LTD. : **POLYNOLS**
RADIANT AGRO CHEM PVT. LTD. : **OXALIC ACID**
ADITYA BUILDERS : **HYDROQUINONE**
BASF : **PALEGAL/SEDIPUR TF:2/PVP K-30**
**TETRAHYDROFURAN**
PERIYAR CHEMICALS LTD. : **FORMIC ACID**
TAN INDIA LTD. : **SORBITOL**
STAR CHEMICALS (BOM) PVT. LTD. : **PHOSPHORIC ACID**
STANDARD ALKALI : **CAUSTIC SODA LYE/FLAKES/CAUSTIC POTASH/LIQUID CHLORINE/ POTASSIUM CARBONATE/HYDROCHLORIC ACID**
TAMIL NADU CHEMICAL PRODUCTS LTD. : **SODIUM HYDRO SULPHITE**
TRAVANCORE TITANIUM PRODUCTS LTD. : **TITANIUM DIOXIDE**
NEYVELI LIGNITE CORPN. LTD. : **PHENOL/ORTHO CRESOL/XYLENOL/LECO/ MULTIVALENT PHENOL/METAPARA CRESOL**
ASIAN PEROXIDES LTD. **HYDROGEN PEROXIDE**

For more information or to order please contact:

**M/s. RAMNIKLAL S. GOSALIA**

17/21, Issaji Street. 308-310, Parshva Chambers, Vadgadi, Bombay 400 003.
**Tel: 327314/24/03 * Tlx: 011-76882 RSG IN * Gram: NEW LUCKY**

IMPORTED RAW MATERIALS AVAILABLE
WITH **MODVAT & DUTY DRAW BACK** BENEFITS

**PHARMACEUTICALS, COSMETICS FOODS**

- * PROPYLENE GLYCOL U.S.P.
- * AEROSIL - 200 N.F.
- * P.V.P. K-25/30/90 U.S.P.
  (PLASDONE/KOLLIDONE/POVIDONE)
- * ETHYL CELLULOSE N.F.
  N-7, 10, 20/22, 45/50, 200
- * METHYL CELLULOSE N.F.
  Grades: CULMINAL-MC 400, 4000 CPS
- * HYDROXY ETHYL CELLULOSE
  Grades: NATROSOL 250 LR/GR/MR/HBR
- * HYDROXY PROPYL CELLULOSE N.F.
  Grades: KLUCEL EF/LF/GF/HF
- * HYDROXY PROPYL METHYL CELLULOSE
  U.S.P.-2910
  METHOCEL/PHARMACOAT/METOLOSE
  METHOCEL E3/E5/E15/E50, E-4M, F-4M
  METHOCEL K-100, K-4M, K-15M
  PHARMACOAT 603, 606, 615
- * MICROCRYSTALINE CELLULOSE U.S.P./N.F.
  AVICEL PH 101/PH 102/RC-581/RC-591
- * CROSSLINKED NaCMC, U.S.P.
  AC-DI-SOL (TABLET DISINTEGRANT)
- * SODIUM STARCH GLYCOLATE U.S.P.
- * CROSPOVIDONE U.S.P. (DISINTEGRANT)
  KOLLIDONE CL/POLYPLASDONE XL
- * SODIUM CARBOXY METHYL CELLULOSE
  (FOOD/DENTAL/U.S.P. GRADES)
- * TITANIUM DIOXIDE U.S.P. (SUPERWHITE)
  ANATASE GRADE - BACTERIA CONTROLLED
- * CARBOMER/CARBOPOL 934, 940
- * VEE GUM/VEE GUM HV
- * XANTHAN GUM
- * PARA CHLORO META CRESOL B.P.
  (PREVENTOL CMK - CHLOROCRESOL)
- * P.E.G. 400/4000/6000/8000
- * POLYPROPYLENE GLYCOL (P.P.G.)
- * EUDRAGIT (ALL GRADES)
- * DL-LACTIC ACID, 88-92%, U.S.P.
- * POLYSORBATE (TWEEN 80) U.S.P.
- * VANILLIN/ETHYL VANILLIN
- * N-METHYL-2-PYRROLIDONE (NMP)
- * TERTIARY BUTYL HYDROQUINONE
  (ANTIOXIDANT - T.B.H.Q.)
- * OPADRY
- * CELLULOSE ACETATE PHTHALATE U.S.P.
- * HYDROXY PROPYL METHYL CELLULOSE
  PHTHALATE U.S.P.
- * POLYVINYL ACETATE PHTHALATE U.S.P.

**BULK DRUGS INTERMEDIATES**

- * TETRAHYDROFURAN
- * TERTIARY BUTYL AMINE
- * N-PROPANOL PURE (Undenatured)
- * HYDROXYLAMINE HYDROCHLORIDE
- * ADIPIC ACID
- * BENZALDEHYDE

PLEASE CORRESPOND WITH MR. MUKESH KAMDAR / MR. HARISH SHAH
AT

**CROWN CHEMICAL PRODUCTS**

AT OUR NEW OFFICE ADDRESS

305-B, NEELAM CENTRE, HIND CYCLE ROAD, WORLI, BOMBAY - 400 025
TELEPHONE: OFFICE: 493 7725
493 7726
493 7727
493 4141
RESI: 409 3892
407 5245
646 3287
TELEX : 011-73926 CRWN IN
TELEFAX: 2040390

India's Multinational and Leading Consumers prefer only KGI's Gum
The top quality products
For Your Regular Requirements of:

**Gum Accacia**
(Powder & Crystal)

**Guar Gum**
(Pharma & All Other Grades)

**Gum Tragacanth**
(BPC Standard)

**Gum Arabic * Clove Oil**

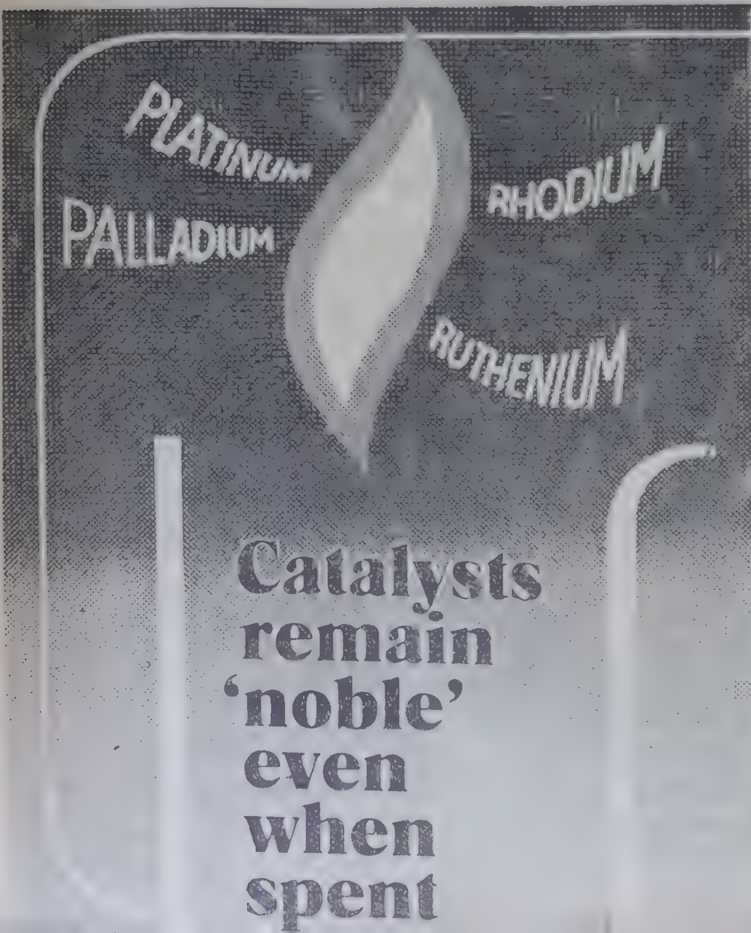
WE CAN SUPPLY AS PER NEW I.P. 1985
WITH MICROBIOLOGICAL TEST

Please Contact:

**KAPADIA GUMCHEM INDUSTRIES**

Together We Progress

G.P.O. Box No 1160, 3 Mint Road, 2nd Floor, Opp. G.P.O., BOMBAY 400 001.
Phones: 2611087/2615073/2617217 Resi.: 6205517/6207028 Gram: PHARMAGUM
Fax No.: 91-22-2612659 Attn.: Mr. RAMESH KAPADIA



**Catalysts remain 'noble' even when spent**

**And when it comes to recovery there's none quite like us.**

We undertake recovery of noble metals from customer's spent catalysts and return them in the form of fresh activated catalysts like 1%, 3%, 5%, or 10% Platinum or Palladium on carriers like activated charcoal, barium sulphate or calcium carbonate or convert them into metals or salts like PALLADIUM CHLORIDE, RHODIUM TRICHLORIDE TRIHYDRATE, CHLOROPLATINIC ACID, PLATINUM OXIDE (ADAM'S CATALYST)

We also manufacture salts of Silver, Gold and Platinum group metals

For further details contact:

**parekh platinum pvt. ltd.**

- 16B, Samhita Ind. Estate, Off Andheri Kurla Road, Bombay 400 072 INDIA.
- Cable: GOLDMARKET
- Phones: 320675, 344274 5126801, 5124798
- Telex: 011-72104 PTRH

NOW AVAILABLE:

**96% A.D. DODECYL BENZENE SULPHONATE**

(HARD ACID SLURRY)

**LINEAR ALKYL BENZENE SULPHONATE**

(SOFT ACID SLURRY)

**SULPHONATED WITH SULPHUR TRIOXIDE**

MANUFACTURERS:

TRADE MARK

**Arochem Silvassa Ltd.,**

Industrial Estate, Silvassa 396 230 -- Via Vapi,
Dadra & Nagar Haveli.
**Phone: 289, 291 Gram: AROCHEM SILVASSA**
**Telex: 0185 201 ARCM IN**

**BOMBAY** : Scent House, Station Road, Goregaon (West), Bombay 400 062.
**Phone: 6722280, Gram: AROSILVASSA,**
**Telex: 011-70038 FAIS IN, Fax: 022-672 0818.**

**KANPUR** : Chemdet Enterprises, Shop 67, 75/232, Sabji Mandi, Kanpur.
**Gram: SCENTOUS, Telephone: 64551.**

**MADRAS** : Syndet Enterprises, 90, Govindappa Naick Street, Madras 600 001.
**Gram: SCENTOUS, Telephone: 569032.**

**DELHI** : B. Shantilal & Co., 1025/5, First Floor, Gali Teliyan, Tilak Bazar, Delhi 110 006.
**Gram: INDOSIL, Telephone: 291 3973.**

*AVAILABLE REGULARLY*

***SPRAY DRIED 40%***
***A.D. ANIONIC DETERGENT***
***POWDER NEUTRAL-pH: 7-7.5***

**In Snow White Colour & Free Flowing**
**Bulk Density below 0.3**

Manufacturers

***Silvassa Syndet Private Limited***

Amli Industrial Estate,
SILVASSA - 396 230 -- Via Vapi,
Dadra & Nagar Haveli
(Phone: 685)

For most competitive quotation, best quality, prompt delivery of

| | |
|---|---|
| **CLOVE OIL** | **(Pharma Grade)** |
| **CINNAMON OIL** | **(Pharma Grade)** |
| **ANETHI OIL** | **(Pharma Grade)** |
| **CASSIA OIL** | **(Pharma Grade)** |
| **AJOWAN OIL** | **(Pharma Grade)** |
| **ORANGE OIL** | **(Pharma Grade)** |
| **CINNAMON LEAF OIL** | **(Pharma Grade)** |
| **ALMOND OIL** | **(Pharma Grade)** |
| **LEMON OIL** | **(Pharma Grade)** |

Please Contact Manufacturers:

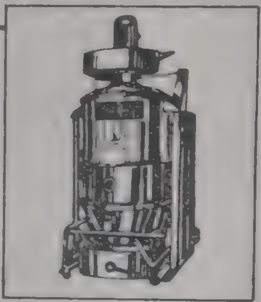
**CHEMICAL PROCESS CONSULTANTS**

Unit 202, Adarsh Ind. Estate, Sahar Road, Chakala, Andheri (East), BOMBAY 400 099.
**Tel: 6325855** **Gram: KEMIPROSS**

RICHARD

*'Just the one you need, A Product of Quality'*

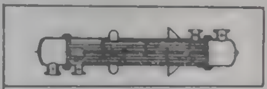
*FROM* **RICHARD ENGINEERING (BOMBAY) PVT. LTD.**

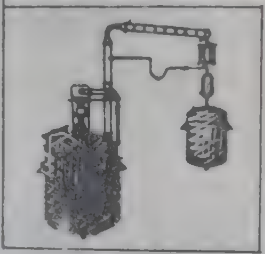


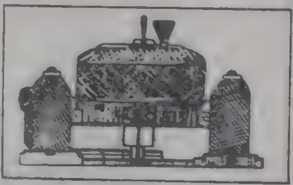
**Who have a proven record of our two decades of experience in chemical equipment manufacturing and are known for Quality, Competitive pricing and delivery on time.**

**Our product range includes.**

☐ FLUID BED DRYER ☐ TRAY DRYER ☐ DRUM DRYER ☐ FLAKER ☐ CENTRIFUGE ☐ LEAF FILTER ☐ PRESSURE FILTER ☐ PRESSURE VESSEL ☐ OPEN REACTION VESSEL ☐ REACTION KETTLE ☐ AUTO – CLAVE ☐ EVAPORATOR ☐ HEAT EXCHANGER ☐ DISTILLATION COLUMN ☐ CRYSTALISER ☐ BALL MILL ☐ BLENDER ☐ GRANULATOR ☐ STORAGE TANK (M.S., S.S., F.R.P., RUBBER LINED, ALUMINIUM AND LEAD BONDING) ☐ DISH ENDS ☐ HYDRO GENERATOR, OTHER CHEMICAL EQUIPMENTS







*CONTACT*

**RICHARD ENGINEERING (BOMBAY) PVT. LTD.**

**ST/CST FREE!!**

Office: 25, M.I.D.C. Chemical Zone, Ambernath, Pincode-421501. Phone: 2513, 2785 Gram: RICHARD
Branch Office: 24, 1st Floor, South Usman Road, T. Nagar, Madras-600017. Phone: 44 33 28
Factory: Plot No. C-10, Lote Parshuram Ind. Area Chiplune, Dist. Ratnagiri, Phone: 79, 279, 278.

MANI

AVAILABLE REGULARLY

**OXALIC ACID**

Please Contact

**BAJAJ ORGANICS (P) LTD.**

102, Yogeshwar, 135/139, Kazi Sayed Street, Bombay 400 003.
**Telex: 11-75969 BJAJ-IN** **GRAM: CAUSTICLYE**
**Phone: 348406/335133/333171** **Resi.: 653581**

*Branch Office:*

Arunodaya Apartments,
1st Floor,
Room No. J,
7-1-70, Dharam Karan Road, Ameerpet,
HYDERABAD 500 016.
**Phone: 228004/36472**
**Telex: 425-2163 BJAJ IN**
**Gram: CAUSTICLYE**

89, Chandan Society,
Opp. Yashoda Nagar Tekro,
Ahmedabad Bombay Highway,
Yashoda Nagar,
AHMEDABAD.
**Phone: 834546**

**FOR YOUR REQUIREMENTS OF:**

**TRICHLOROETHYLENE**
**PERCHLOROETHYLENE**
**AND**
**TETRACHLOROETHANE**

Contact

**For North India:**

**M/s. B.S. MEHRASONS PVT. LTD.**

B-1/14, Ashok Vihar Phase II, Delhi 110 052

**Phones: 741742/7118800/2512975/2916979**
**Telex: 031-78005 PEC IN**

**For Maharashtra & Goa:**

**M/s. PHARMA CHEMICALS**

302, Karsan Natha Trust Building,
330, Samuel Street, Vadgadi, Bombay 400 003.
**Phones: 344115/342889/337417**
**Telex: 011-73635 BSM IN**

Consignee Agents & Stockists of:

**M/s. THE METTUR CHEMICAL & INDUSTRIAL CORP. LTD**

NOW **CHEMICALS AND PLASTICS INDIA LTD.**

**Other Products: C.T.C. • CHLOROFORM • METHYLENE CHLORIDE • ETHYL SILICATE**
**FUMED SILICA • AROMATIC CHEMICALS**

**AVAILABLE IN BULK QUANTITY, BEST QUALITY MATERIAL**
**AGAINST MODVAT FACILITY & TAX BENEFITS**

1. **RUBBER CHEMICALS: Accelerators & Antioxidants:** Succure T.M.T.D., Succure F, Succure Z.D.E.C. Succinox S.P., Zincosat, Stickex, Rubber Foam Stabilisers.
2. **METALLIC STEARATES & PVC STABILIZERS: For Rigid PVC Pipes & Cables**
   a) *SOLID:* TBLS, DBLS, DBLP, L.S., C.S., Lead Complex Stabilisers LI 612 & LI 615
3. **ORGANO TIN STABILISERS: Toxic & Non Toxic**
4. **FATTY ACIDS: Stearic, Oleic, Recenoleic & other Fatty Acids**

CONTACT MANUFACTURERS

**SUBRAY CATAL CHEM PVT. LTD.**

G-42, 'D' Wing, Dewan Apts. No. 2, Vasai Road (E), Dist. Thane. PIN: 401 202
**Phone: (02523) 3117/(02523) 3118**
*Bombay Office:* A-10/3, Indrayudha Hsg. Society, M.G. Road, Goregaon (W), Bombay - 400 090.
**Phone:C/o. 6722018**

*Available in Bulk Quantity and ready stock*

**FRUSEMIDE I.P./B.P.**

**FENBENDAZOLE**

**C.P. MALEATE**

**DIMETHYL AMINO ETHYL CHLORIDE HCL**

**MEBENDAZOLE U.S.P.-22**

**MEBENDAZOLE U.S.P.-22** (White)

**RIFAMPICIN**

**ALBENDAZOLE**

**FLUBENDAZOLE**

**DIMETRIDAZOLE (VET)** (for export)

WANTED LOCAL AGENTS/STOCKISTS IN UNREPRESENTED AREAS

**TRANSCHEM PVT. LTD.**

56, Ridge Road, Malbar Hill, BOMBAY 400 006.
Phone: 8123636 - 8128608 - 8117511 - 8113334

from quality toppers

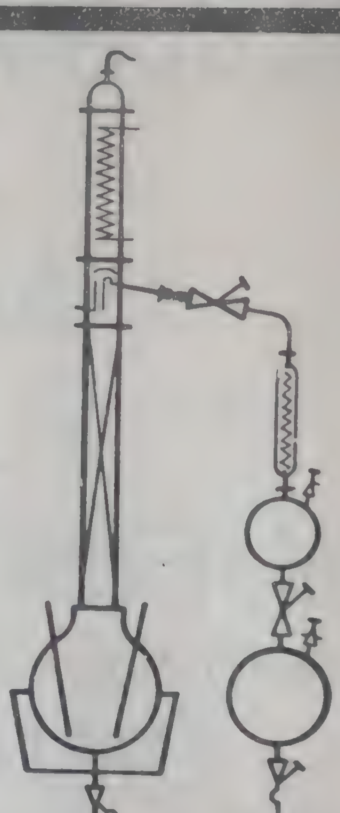
YOUR PACKING PROBLEM
IS NOW SOLVED.

Because Reliance Jerrycans & Barrels are manufactured on most sophisticated automatic Blow-moulding Machines with rigid quality control and passing through all kinds of different tests assure you the best guaranteed protection to your precious products.

**Reliance**
JERRYCANS & BARRELS

Manufactured by:
**RELIANCE PLASTICS**
11-A, Unique Industrial Estate,
Opp. Jawahar Talkies, Mulund (West),
Bombay - 400 080.
Phone: 5619994, 5618131 Res: 5613186

SC



EXTRA STRONG
PROCESS GLASS EQUIPMENT
goel Introduces XTRONG range

OUR PRODUCTS : BOROSILICATE Glass Vessels, Pipe sections, Reducers, Tees, Bends. Valves, Column, Sections, Reflux Dividers, Heat Exchangers, Stirrers, Sight Glasses, Couplings and Teflon items and their installation.

OUR SPECIALITIES :

High Vacuum Reaction & Distillation Units
HCl Absorbption/Generation/Distillation Units,
Pipe Line/Column Components of 9" & 12" Dia.
Liquid/Liquid & Solid/Liquid Extraction Units.

**goel scientific works pvt. ltd.**
D/35, Sardar Estate, BARODA-390 019.
Ph. : 541692 Tlx. : 0175 565 GOEL IN

**The Planet Earth is the greatest chemist we know.**

What fecund and creative chemistry.
Every human, plant, animal, rock, gas or liquid on earth has a simple or complex chemistry behind it. The idea of so much thought and unconscious formulation seems mind-boggling, but Nature does it regularly and effortlessly.
It inspires us.

Process chemicals for the textile industry for Sizing, Desizing, Mercerising, Scouring, Dyeing, Printing and Finishing.

SUPERTEX®

SUPERTEX®
(INDIA) CORPORATION
132, Dr. Annie Besant Road, Bombay-400 018
Phone: 493 6041, 493 38 18, 493 5482.
Grams: 'Thinogum'. Telex: 75643.

a M.G. Saraf Enterprise
Most trusted name in chemicals.

ATTENTION ► END USERS, EXPORTERS

YOUR SEARCH FOR THE BEST QUALITY OXALIC ACID ENDS HERE!

OVER 99% PURITY

Paschim Chemicals Pvt. Ltd.

**Admn Office:**
402, Chartered House. 293/299
Dr. Cawasji Hormasji Street,
Marine Lines Bombay-400 002.
Tel 253421, 297158.

**Regd. Off:**
524, Cotton Exchange
Kalbadevi Road
Bombay 400 002
Tel: 314637

ATTENTION

SCANOMAX INDIA LIMITED
OFFERS
BULK DRUGS & DRUG FORMULATIONS
AT REASONABLE PRICES

- 6 APA
- AMPICILLIN TRIHYDRATE I.P./B.P.
- ATENOLOL B.P.
- AMOXYCILLIN TRIHYDRATE I.P/B.P.
- CEPHALEXIN I.P.
- CLONIDINE I.P.
- MEBENDAZOLE I.P.
- GLIBENCLAMIDE I.P.
- PIROXICAM I.P.
- NIFEDEPINE I.P.
- IBUPROFEN I.P/B.P.
- CLOXACILLIN SODIUM I.P.
- FURSEMIDE I.P.
- CHLORAMPHENICOL I.P.

CONTACT

SCANOMAX INDIA LIMITED

**Admn. Office.**
2504, Sector 35-C
**CHANDIGARH.**
Phone — 43098
Telex 395 237 FIDC IN

Flat No: 916, 9th Floor
Arunachal Building
Barakhambha Road
**NEW DELHI**

**BRANCH OFFICES**

184, Poonamallee High Road,
Post Box No. 1006,
**MADRAS-600 010**

**Works.**
Vill. Channo,
23 KM Stone on
Patiala Sangrur
Highway, Distt.
**SANGRUR. (PB.)**

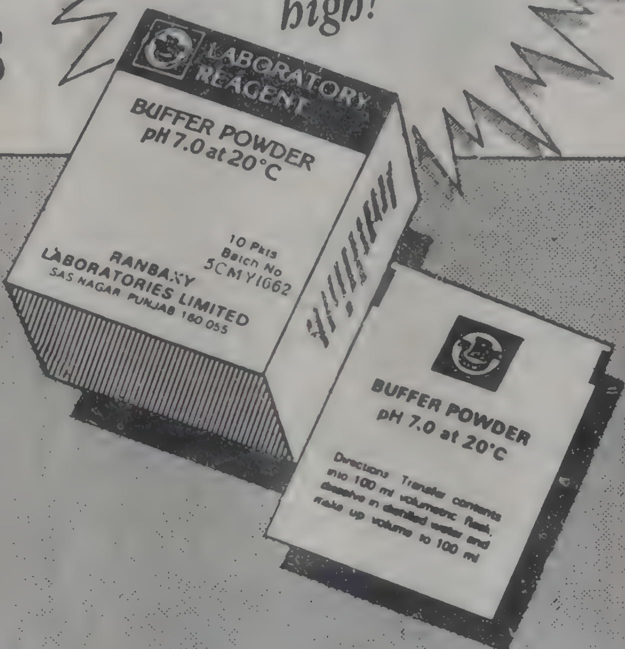
4-B, Little Russell Street
**CALCUTTA-700 071**

Now,
for the first time in India

**RANBAXY**
introduces
Buffer Powders

*In unique, moisture-proof satchets—that keep the powder dry & the accuracy high!*

the innovation over tablets the world is switching to!


LABORATORY REAGENT
BUFFER POWDER
pH 7.0 at 20°C
10 Pkts
Batch No
5CMY1662
RANBAXY
LABORATORIES LIMITED
SAS NAGAR PUNJAB 160 055
BUFFER POWDER
pH 7.0 at 20°C
Directions Transfer contents into 100 ml volumetric flask, dissolve in distilled water and make up volume to 100 ml

Ranbaxy now offers for the first time in India buffer salts in powder form. Buffer powders have gained widespread acceptance in the developed countries and are gradually replacing the use of buffer tablets. Moisture proof satchets keep the material dry and free flowing leading to greater accuracy. Ranbaxy's buffer powders are available for pH 4.0, 7.0 and 9.2.

Count your advantages

1. Tablets take a long time to go into solution whereas Ranbaxy's Buffer Powders dissolve instantly
2. The glassine poly satchets keep the powder completely free from moisture.
3. Ranbaxy's Buffer Powders, a superior product by all standards; are very competitively priced.

*For your requirements, please contact:*

RANBAXY
LABORATORIES LIMITED

CHEMICAL DIVISION MARKETING OFFICE
16, MARINA ARCADE, CONNAUGHT CIRCUS
NEW DELHI - 110 001
Phones 323738, 323739, Telex : 031 4220
Cable : RANBAXYLAB CONNAUGHT CIRCUS

Put **RANBAXY** Reliability in your Laboratory !

**MANUFACTURERS OF ACID MILLING DYES**

RED RS * RED G * RED GRS * RED 3BN *
PINK R * RED F2R * MAROON V *
NAVYBLUE- S5R * YELLOW 5GN *
YELLOW M * YELLOW N4GN *
GOLDEN YELLOW N2M *
METAL COMPLEX BLACK WA &
DIRECT DYES

chromill colour industries

**CHROMILL COLOUR INDUSTRIES**

**INTERMEDIATES for DYES Manufacturers**

2:5 DICHLORO 1:4 SULFOPHENYL -
3 METHYL 5 PYRAZOLONE *
1:4 SULFOPHENYL 3 METHYL 5 PYROZOLONE *
G-SALT * EBA METASULFONIC ACID. *
PARA AMINO AZO BEZENE SULPHONIC ACID *

**SHIDIMO INTERAUX PVT. LTD.**

Office: 901-902, Adatia Awas, Bombay Market,
Umarwada, SURAT 395 010.
Gram: CHROMILL
Phone: 44438, 43758

Factory: S.No.: 245, LAJPORE. 394 235
Via Sachin Dist. Surat.
Phone: 60, 61.

Export Inquiries Solicited.

**RUKMA-CHEM Offers**

**NONIONICS**

**BASED ON NONYL PHENOL OCTYL PHENOL, CASTOR OIL, FATTY AMINES ETC.**

POLYSORBATES 20, 60, 80,
EMULSIFYING WAX
CETOMAGRAGOL 1000

| | | | |
|---|---|---|---|
| P.E.G. | 200 | P.E.G. | 1450 |
| P.E.G. | 300 | P.E.G. | 3000 |
| P.E.G. | 400 | P.E.G. | 4000 |
| P.E.G. | 600 | P.E.G. | 6000 |
| P.E.G. | 1000 | P.E.G. | 8000 |

EMULSIFIERS : DEMULSIFIERS
ANTISTATIC OIL : CONING OIL ETC.

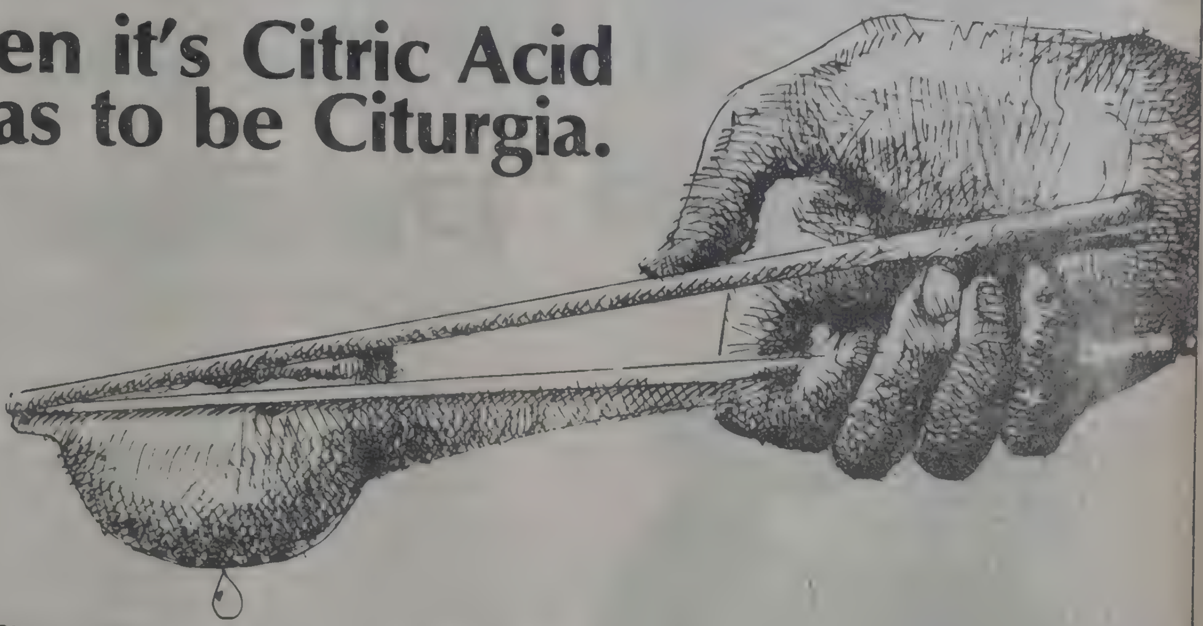
**CALCIUM SALT IN BUTANOL 70% ACTIVE**

*Contact Manufacturers*

Rukma

**Rukma-Chem Products P. Ltd.**

**Office:** SM Bhavan, Plot No. B-7 & B-10,
Road No. 8 & 15, Wagle Industrial Estate,
Thane 400 604. Maharashtra.
**Tel. No.: 509383/594144/594145**
**Telex: 011-79380 SMIM IN Fax: 31-22-6344985**
**Works:** W-89(D), M.I.D.C., Chemical Zone,
Taloja, Panvel, Dist. Raigad.
**Phone: 410 TALOJA**



# When it's Citric Acid it has to be Citurgia.

The name Citurgia is today synonymous with Citric Acid of the finest quality. Citurgia caters to more than just one need in more than just one industry. Besides the traditional usage of Citric Acid in food, soft drinks, confectionery and drugs; today the uses of Citric Acid extend to new areas:

* In the textile printing and dyeing industry it provides 'STABLE pH' conditions for polyester and nylon. As also for acrylic prints curing and cotton-resist printing. Citric Acid has successfully replaced imported Tartaric Acid because of its excellent quality, low costs and easy availability. Also, it is a very safe acid compared to other organic and inorganic acid salts.

* Citric Acid prevents flavour deterioration, rancidity and discoloration in edible oils.

* It imparts an acidic taste to dry powdered drinks.

* It is also used as a descaling solution.

Citurgia Biochemicals Ltd. is the largest producer of high quality Citric Acid in India. Besides catering to the domestic demand, Citurgia's Citric Acid is exported to USA, Japan, Germany, Australia, Iran, Malaysia, Sri Lanka and other countries.

# Citurgia Citric Acid India's No.1

CITURGIA BIOCHEMICALS LIMITED
Regd. Off: Neville House, J.N. Heredia Marg, Ballard Estate, Bombay 400 038
Tel: 268071 Gms: CITURGIA BOMBAY.

Tlx : 11-73372 BDM IN

CS/285

FOR FABRIC COLOURS OF ALMOST LIFE-LIKE CLARITY

"Premier"

YOUR FIRST CHOICE FOR QUALITY DYES

We manufacture the NAPTHOLS & FAST BASES under quality control through our R & D Department

1. FAST GARNET GBC BASE
2. FAST SCARLET G BASE
3. FAST SCARLET RC BASE
4. FAST SCARLET R BASE
5. FAST RED B BASE
6. FAST ORANGE GC BASE
7. FAST YELLOW GC BASE
8. FAST BOARDEAUX GP BASE
9. FAST RED KB BASE
10. FAST RED TR BASE
11. FAST RED R BASE
12. FAST RED RC BASE
13. FAST BLUE B BASE
14. FAST CORINTH B BASE

and many more still to come...

Manufacturers
**PREMIER DYE-CHEM INDUSTRIES**
Office: 15-A, Haresh Chambers, 3rd Floor,
313-319 Samuel St., Vadgadi, Bombay-400 003. India.
Phones: Off: 327629, 349605. Resi: 6490400
Gram: "TAWATA" Factory: A-185, M.I.D.C. Phase I,
Dombivali (East), Dist. Thana, MAHARASHTRA.

We guard your Valuable Property...

An outcome of the thorough study of the needs of industrial storage and packaging, by our team of experts, now JYOTI INDUSTRIES launches its new DRUM DIVISION

The Drum Division manufacturers H.D.P.E. blow moulded containers like jerry cans, rocket type [illegible] and round [illegible] with [illegible]

... by strong walls of protection.

**JYOTI Industries**
(drum division)
**Manufacturers of blow moulded H.D.P.E. containers upto 100 litres.**
**JERRY CANS, CARBOYS, DRUMS**
**OFFICE:** 34, Unique Industrial Estate (New), R P Road,
Opp. Jawahar Cinema, Mulund (W), Bombay-400 080
**Phone: 561 57 68, 560 29 68**
**WORKS:** Poona — Bombay Road, Opp. Amrut Nagar, [illegible]

# If the history of planet Earth can be seen as 1 day, then,

**1) The Human species arrived only 10 minutes ago.**
**2) Civilization is only 5 seconds old.**
**3) The Industrial Revolution only 1/8th of a second.**
**Yet so much has been achieved in 1/8th of a second.**

**Superchem making the most of 1/7th of 1/8th since we arrived 'only' 30 - years ago;**

**Process chemicals for the textile industry for Sizing, Desizing, Scouring, Mercerising, Dyeing, Printing and Finishing.**

SUPERCHEM®

**SUPERCHEM®**
132, Dr. Annie Besant Road, Bombay-400 018
Phone: 493 6041, 493 38 18, 493 5482.
Grams: 'Thinogum'. Telex: 75643.

a M.G. Saraf Enterprise
Most trusted name in chemicals.

FOR YOUR REQUIREMENTS OF:

- * Vinyl Sulphone Dyes -- Turquoise Blue G
- * Reactive Turquoise Blue H5G, H7G, H2G
- * Reactive Navy Blue HR
- * Direct Turquoise Blue

FOR EXPORT

*CI BLUE -- 21*
*CI BLUE -- 25*
*CI BLUE -- 59*
*CI BLUE -- 86*

Contact Manufacturers:
**AT BOMBAY OFFICE:**

**BLUESTONE DYE CHEM INDUSTRIES**

**Office:**
77/87, Abhechand Gandhi Marg,
Shreeji Krupa Building,
Room No. 19, 2nd Floor, Bombay 400 003.
**Phones: 342466/324526, C/o. 345512, Resi.: 5610860**

**Factory:**
Shed No. C-1/B-3, G.I.D.C., Vapi,
Dist. Bulsar, Gujarat, Pin 396 195.
**Phone: 837.**
**(Export enquiries also solicited)**

*Associated Concern* **KUSUM DYE CHEM INDUSTRIES**
Plot No. 303 8/D, G.I.D.C. Vapi. District Bulsar, Gujarat Pin. 396 195.

**Introducing for the first time in India**

Anatto Colours [Natural Colour]
Available food Colours-Tartrazine, Carmoisine
Brilliant Blue FCF, Sunset Yellow FCF.
**Brilliant Blue FCF Special Supra (ISI)**

Fast Green FCF (ISI), CI 42053 Suitable for bright black & brown Available in Lake Form and Special colours for Capsules and cosmetics.

Also available Alizarine Cyanine Green F, Colour Index No. 61570 Eosine and Acid Yellow 73 (Uranine)

Solicit your Enquiry for Food Colour Mixtures, Pea Green, Black, Chocolate Brown etc. and also for Lake Colours

NECOL

**Neelikon Dyestuffs.**
204, Dr. D.N. Road, National Insurance Bldg.,
First Floor, Bombay 400 001. Tel.: 204 53 22

**Ethylene Dichloride 250 Kg. HDPE Drum Packing Formaldehyde 220 kg. HDPE Drum Packing**

**TRIETHANOLAMINE DIETHANOLAMINE MONOETHANOLAMINE**

**ETHER PETROLEUM 40-60/60-80/80-100/80-120/90-100/100-120 OLEIC ACID TECH**

**AMYL ACETATE**
**BUTYL CELLOSOLVE ACETATE**
**BUTYL CARBITOL ACETATE**
**CELLOSOLVE ACETATE**
**MONOCHLORO BENZENE**
**TRICHLORO BENZENE**
**PARA DICHLORO BENZENE**

**CARBITOL ACETATE**
**ISOPROPYL ACETATE**
**METHYL ACETATE**
**OCTYL ACETATE**
**ORTHO DICHLORO BENZENE**
**ISO AMYL ALCOHOL**

**TRIETHLAMINE**
**DIETHYLAMINE**
**MONOETHYLAMINE**
**MONOISOPROPYLAMINE**
**DIISOPROPYLAMINE**
**MONOCYCLOHEXYLAMINE**
**DICYCLOHEXYLAMINE**

For INK / VARNISH / PAINTS Mfgs
**MALEIC RESIN (Spirit Soluble / Oil Soluble)**
**POLY VINYL BUTYRAL (P.V.B.)**

QUALITY CSC SOLVENTS

**Chemical Solvent Centre**
43, Princess Street, 3, Devkaran Mansion, 1st Floor, Bombay 400 002.
**Office: 314293 * 313812 * 254853 Resi: 8114061 * 6301104**
**Gram: CHESOLVECE * Telex: Asim 011-73145**

*Where Quantity & Quality Matter*
*always Count on....*

KC
KRIPA'S

ACID SLURRY

SODIUM LAURYL SULPHATE
(POWDER, NEEDLES & LIQUID)

SODIUM LAURYL ETHOXY SULPHATE

INDUSTRIAL DETERGENT 40%

HOUSE HOLD DETERGENT POWDER
SPRAY DRIED - 25 Kgs. BULK PACKING

KC
KRIPA'S

KRIPA CHEMICALS PVT. LTD.

**Admn. Office:**
8/9/10 'Royal Chambers',
S. No. 47, Paud Rd., PUNE-411 038.
**Phone:** 333245, 331825, 331855
**Telex:** 0145-729 KRIPIN

**Branch Office:**
House No. 1024, 10th Main Road,
West of Chord Road, IIIrd Stage, 1st Block,
Bangalore-560 079. **Phone:** 357393

For Quality And Quantity

**Mono Chloro Benzene (M.C.B.)**
**Para Di Chloro Benzene (P.D.C.B.)**
**Ortho Di Chloro Benzene (O.D.C.B.)**
**Tri Chloro Benzene (T.C.B.)**

Contact Manufacturers:

**CHEMIEORGANIC**

G-6, Everest, Tardeo, Bombay 400 034.
**Phones: 4949468/494195. Gram: SYNTHORGAN, Bombay-34. Telex: 011-76297 BABA IN**

---

Are you Quality Conscious?

**USE BRILEX ACTIVATED CARBON**

A trusted name in Quality for over two decades. Grades equivalent to International Standards as per NORIT, DEGUSSA, TAKEDA and MERCK or as per your specification both powder and granules.

Please Contact

**SUNEETA**
**CHEMICALS**

33, Satnam Bldg., Opp. World Trade Centre, Cuffe Parade, Bombay 400 005
Tel: 216728/213835 Gram: BRILCHEM

---

For Your Regular Requirements of:

**CALCIUM HYPOPHOSPHITE**
**SODIUM HYPOPHOSPHITE NF**
**MAGNESIUM HYPOPHOSPHITE NF**
**MANGANESE HYPOPHOSPHITE**
**CHLORAMPHENICOL IP**

Manufactured by **VICTORY CHEMICALS**
G.I.D.C., VAPI

**HYPOPHOSPHOROUS ACID IP** (30% to 32%) **SODIUM LACTATE 60% SOLUTION**

Manufactured by **VISHAL CHEMICALS**
VAPI

**M/s. KIRAN CHEMICALS**

178 Sant Tukaram Road, First Floor, Bombay 400 009.
**Phone: 8512053, 8517313, 8728929**
Resi : 4076078/4078231/4077254/4075799

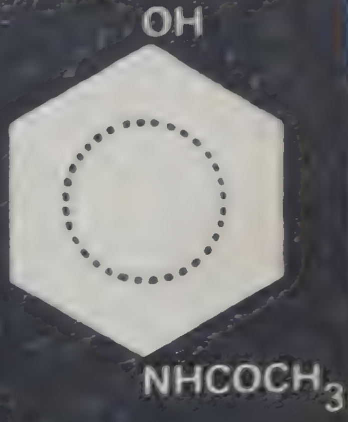
# PARACETAMOL

IP/BP

## CHEMICAL Formula

- Acetaminophen
- 4' — Hydroxyacetanilide
- P — acetylaminophenol
- N — Acetyl p-aminophenol
- P — acetaminophenol
- P — acetamidophenol

## STRUCTURAL Formula



## MANUFACTURAL Formula

# farmson

THE PERFECT PRODUCT OF

## farmson Pharmaceutical Gujarat Pvt. Ltd.

**Head Office:** Shankar Bhuvan, Sayaji Gunj, Vadodara-390 005. Phones 327136/327138
Grams: FARMSON. Telex: 0175-694 KEKE IN
**Works:** 98/1-2-3-4, GIDC Industrial Estate, Nandesan, Dist. Vadodara. Phone 219
**Research Centre:** At Nurpura, Post Baska, Tal. Halol, Dist. PANCHMAHALS

**SALES OFFICES:**

**Bombay:** 404, Embassy Centre, Nariman Point, Bombay 400 021. Phones 231144, 230383.
Gram: KEKEVII
**Hyderabad:** 1-1-700/B-1, New Bakaram, Hyderabad-500 380. Phone 65836. Gram: FARMSON.

**Regional Representatives**

- KHOKANI ASSOCIATES, 3rd Floor, Keshav Baug, 116, Princess Street, BOMBAY-400 002. Tele. No. 252244, 252688
- PAN ASIAN Commercial Corporation, 4, Rabindra Sarani, CALCUTTA-700 001. Tele. No. 277595-475047. Cable: PANASIAN.
- B & I Enterprise, Cama Building, 2nd Floor, 24/26, Dalal Street, BOMBAY-400 023. Tele. No. 271964.
- NEELGIRI AGENCY, B-5, Shivlok House-1, Karampura Comm. Centre, Opp. Milan Cinema, Najafgarh Road, NEW DELHI-110 015. Tele. No. [illegible]

NIRMAL

## The Biggest Manufacturer of India

Sterling

PETROLEUM BENZINE (PETROLEUM ETHER)
40°-60°/60°-80°/60°-95°/80°-100°/80°-120°/90°-100°/100°-120°
HEXANE 65°-70° EMULSIFYING WAX

* *

AROMATIC CHEMICALS

* *

AMYL BUTYRATE ETHYL BUTYRATE BUTYL BUTYRATE
ISO BUTYL BUTYRATE ISO AMYL ACETATE AMYL PROPIONATE ETHYL PROPIONATE
SCHAEFFER'S ACID (AS SODIUM SALT) (Export Enquiries Solicited)
Contact Manufacturers

STERLING ORGO & INORGO CHEMICALS P. LTD.

**Regd. Office:** 340/42, Samuel Street, Raut Chamber, 4th Floor, Bombay 400 003.
**Phones: 333601/333602/338722 Telex: ASIM IN 73145 Fax: 331738**
**Factory:** Plot AF-1, Cama Industrial Estate, Walbhat Road, Goregaon (East), Bombay 400 063.
**Phone: 6730458/6734593/6734650 Resi.: 352625/364354/8114061**

For your Requirements of:

EDTA, NTA and their Salts

Used in Agriculture, Textile, Rayon, Soaps and detergents, Rubber, Paper, Leather, Pharmaceuticals, Electroplating, Photography, Water-Softening, Paints, Plastics, Resins, Cosmetics and Various other Industries as Chelating/Sequestering/Metal Complexing Agents.

please contact manufacturers :-

CHEMOFINE INDUSTRIES

138, MADHANI ESTATE, 542, SENAPATI BAPAT MARG,
DADAR (W), BOMBAY: 400 028. (Factory at Chembur, Bombay.)
Tel. Office: 4229932. Residence: 4220392.

PRINT DESIGN

INTRODUCING

LIQUID $SO_3$

OLEUM 65%, OLEUM 23/25% & SULPHURIC ACID 98%
SULPHURIC ACID BATTERY GRADE (Concentrated)
PLEASE CONTACT THE MANUFACTURERS

GOPALANAND RASAYAN

(A Division of the Indian Link Chain Mfg. Ltd.)
We ensure
* REGULAR SUPPLIES ON LONG TERM BASIS * MEETING WITH ALL I.S.I. SPECIFICATIONS
* PROMPT DELIVERY AS PER YOUR SCHEDULE

**Registered Office:**
Lal Bahadur Shastri Marg,
Bhandup (West),
Bombay 400 078.
Tel. No.: 502311/566803

**Marketing Division:**
59, Sonawala Building, 2nd Flr.,
Bombay Samachar Marg.
Bombay 400 023.
Tel. No.: 256519/317387

**Factory:**
Plot No. D 18,
M.I.D.C. Boisar,
Tarapur 401 506 Dist. Thane
Tel. No.: 2421/2422

*Connected to one of the oldest industries in the world, which incidentally is also the youngest.*

***From ancient garments made of bark and hide, through historical finds of Chinese silk and Egyptian cotton at burial sites, to modern fabrics made on computerized looms, humankind's relations with clothes are as old as civilization. From the time when lamp-black, powdered lapis lazuli, red ochre, dye secretions of the banded murex snail, indigo and other plant, mineral and animal dyes have been used, human facination with colouring agents is also well known.***

***We at Texchem continue this oddyssey, this quest for cloth and its colour.***

***Process chemicals for the textile industry for Sizing, Desizing, Scouring, Mercerising, Dyeing, Printing and Finishing.***

TEXCHEM®

TEXCHEM®

*132, Dr. Annie Besant Road, Bombay-400 018*
*Phone: 493 6041, 493 38 18, 493 5482.*
*Grams: 'Thinogum', Telex: 75643.*

*a M.G. Saraf Enterprise*
*Most trusted name in chemicals.*

FOR YOUR REGULAR REQUIREMENTS OF:

**SODIUM DICHROMATE**

**(Manufactured By: KONARK CHROME CHEMICALS PVT. LTD.)**

Please Contact:

**BHANWARLAL JHANWAR & SONS**

201/203, NARSI NATHA STREET, ROOM NO. 9, 3RD FLOOR, BOMBAY 400 009.
**Phone: 8555289 - 863114 * Resi: 6735464**

**WE ALSO OFFER**

**HYDRAZINE HYDRATE 80% - MORPHOLINE - CYCLOHEXYLAMINE**

**AMMONIA**

**Gas**

**Purity-99.5%**
**In Cylinders of 40 kg./50 kg.**
**In Tankers of 500 kg.**
**In Road Tankers of 5, 6, 6.5 M.T**

**Liquor**

**Sp. Gravity 0.910 & 0.888.**
**In Road Tankers, Drums & Carboys**

Please Contact:

***JAYSONS CHEMICAL INDUSTRIES***

SAKI VIHAR LAKE ROAD, POST BOX NO 8968, SAKINAKA, BOMBAY - 400 072
**Phones: 582704/589205/589208**
**Grams: JAYSONS--Bombay-400 072**

**BRANCHES**

261, Kandla Kashan Street,
Delhi-110 006
**Phone: 235516**
**Gram: 'JAYCI'**

Plot No. 317/7, G.I.D.C.,
Vapi, Dist. Bulsar-396 195
**Phone: 1689**

18-A, Mai Krupa Society,
Old Channai, Highway Road,
Baroda
**Phone: 22161**

We Offer A Best Quality at a Very Competitive Rates
For your Small & Bulk Requirements Of:

**Phosphorous Tri Chloride ($PCl_3$)**
**Phosphorous Oxy Chloride ($POCl_3$)**
**Phosphorous Pentoxide ($P_2O_5$)**
**Tri Ethyl Phosphate (TEP)**
**Tri Chloro Molybdenum Phosphide (TCMP)**

Please Contact Manufacturers:

**SANDHYA DYES & CHEMICALS**

**Regd. Office & Works**
Plot No. 1703, G.I.D.C. Sarigam,
Sarigam 396 155, Bulsar, Gujarat.
**Phone: 149 (Bhilad Exchange)**

**Bombay Sales Office:**
5/7, Modern Villa Building
7th Road, Santacruz (East), Bombay 400 055.
**Phone: 6146516**

# DISCOVER, THE STRENGTH OF PROTEINS FROM NATURE ITSELF

Extracted from Soya, Groundnut and milk. From the source that never does harm. The right mix in any Food-Pharma formulations. In a range that includes:

CASEIN PROTEIN HYDROLYSATE
(80% Protein)
CASEIN PROTEIN HYDROLYSATE
(70% Protein)
CASEIN PROTEIN HYDROLYSATE
(60% Protein)
SOYABEAN PROTEIN
HYDROLYSATE (60% Protein)
GROUNDNUT PROTEIN
HYDROLYSATE (60% Protein)
SODIUM & CALCIUM CASEINATES.
AND PAPAIN N.F./U.S.P.

# ENZO-CHEM

For details contact:

**ENZO-CHEM LABORATORIES PVT. LTD.**
Post Box No. 28, Yeola-423 401, Dist. Nasik, India.

**Exports & Marketing:**
'Kailas' 3rd floor, 320,Sir Bhalachandra Road, Matunga (E), Bombay-400 019.
Phone: (91) 22-4374887-4378078 Telex. 4711 71410 ENZO IN

AVAILABLE

* STEARIC ACID (All Grades)
* RICE BRAN DISTILLED FATTY ACID
* GLYCERINE (I.W.)

For Quality, Competitive Prices & Regular Supplies

Contact:

**FOODS FATS & FERTILISERS LTD.**

G.P.O. Box No. 10066, Green House, Green Street, Fort, Bombay 400 023.
Tele: 2862136/2861846

**25 Glorious Years!**

For Your Requirements Of:

SACCHARINE INSOLUBLE I.P.
TARTARIC ACID (IMPORT SUBSTITUTE)
SODIUM POTASSIUM TARTRATE I.P./TECH
SODIUM CITRATE I.P.
CITRIC ACID I.P.
SACCHARINE SODIUM I.P.
CREAM OF TARTAR I.P./FOOD GRADE
ANTIMONY POTASSIUM TARTRATE I.P./USP
DISODIUM HYDROGEN CITRATE I.P.

**Other Fine Chemicals of L.R. & A.R. Grades in bulk as per Highest International Standards**

Please Contact:

**KRYSTAL PHARMA PRIVATE LTD.**

**Office:** 'Deepa', Block No. 3, 353/B-2, Vallabhaug Lane, Ghatkopar, Bombay 400 077.
**Phone: 5112423/5120040**
**Factory:** Road No. 30-31, G.I.D.C. Industrial Area, Phase II, Sarigam, Dist. Bulsar, Gujarat.

FOR YOUR REQIUREMENTS OF

Ammonia Gas
Ammonia liquor

PURITY 99.5% IN CYLINDERS OF 40 & 50 KGS ROAD TANKERS OF 5, 6, 7 M.T. SPECIFIC GRAVITY 0.910 & O.888 IN ROAD TANKERS, 7-9 M.T., DRUMS, CARBOYS & BOTTLES

Please Contact: **ASCO CHEMICAL COMPANY**

61, Bombay Talkies Compound, Post Box No. 17629, Malad (West), Bombay 400 064.
Tel.: Off.: 6820151/6821667/692233; Resi.: 6265775; Gram: "PAGODA" Malad Bombay 64.
Factory: Plot No. 4, Mira Co-op. Industrial Estate, Mira, Dist. Thane. **Telephone: 663691**
**And Also Available At Ankleshwar (Guj).**

**ANKLESHWAR AMMONIA SUPPLY CO.**

Plot No. 6508, GIDC, Ankleshwar, Gujarat.
ANKLESHWAR: (M. STD CODE No. 0264622) Tele.: 3010

## JELLY-FILLED CABLES PROVIDE COMMUNICATION THRUST

SPECIAL GRADE PETROLEUM JELLY IS USED AS JELLY FILLING COMPOUND IN THE CONSTRUCTION OF MULTIPLE CORE TELEPHONE CABLES MADE OF COPPER WIRE INSULATED WITH POLYETHYLENE.

COUNTRY'S REQUIREMENTS FOR SUCH CABLES IN THE NEXT FIVE YEARS HAVE BEEN ESTIMATED AT OVER 800 MILLION METERS. TO MEET THIS DEMAND MANY PRIVATE UNITS HAVE BEEN FLOATED TO PROCESS SUCH TELEPHONE CABLES. NATURALLY THE DEMAND FOR THE SPECIAL GRADE OF PETROLEUM JELLY IS EXPECTED TO GO UP CONSIDERABLY.

**MAHESH (INDIA),** ONE OF THE MOST ACCREDITED AGENTS IN INDIA, REPRESENT GOOD MANY MANUFACTURERS ABROAD, SOME OF THEM ARE MULTINATIONS, AND OFFER RAW MATERIAL FOR JELLY FOR JELLY-FILLED CABLES. OUR JAPANESE PRINCIPALS ARE PIONEER IN PRODUCING SUCH RAW MATERIALS OF VERY HIGH GRADE.

MANUFACTURRS ALREADY ENGAGED IN PRODUCING JELLY FOR JELLY-FILLED CABLES, PLEASE SEND THE FOLLOWING INFORMATION.

MONTLY PRODUCTION CAPACITY :

QUALITY ANALYSIS OF PRESENT PRODUCTION :

RAW MATERIAL ALREADY USING, WITH SPECIFICATIONS :

ON RECEIPT OF THE ABOVE INFORMATION, WE WILL SUGGEST THE MOST APPROPRIATE RAW MATERIAL TO BE IMPORTED FROM JAPAN. OUR JAPANESE PRINCIPALS WILL BE HAPPY TO TEST THE SAMPLE. ONCE THIS IS SET, WE WILL INTRODUCE ONE MORE CHEMICAL TO BE IMPORTED FROM EUROPE. THIS WILL FURTHR IMPROVE THE QUALITY AND WILL BRING DOWN THE WEIGHT OF JELLY.

PLEASE SEND DETAILS TO:

**MAHESH (INDIA)**

808, COTTON EXCH. BLDG., KALBADEVI ROAD, BOMBAY - 400 002.

**PHONES : 311190/255817**
**CABLE : DEEPKETAN, BOMBAY-2**

**TELEX : 11-84418 MHSH IN**
**FAX ; 91(21)318756**

**" A TRUSTED NAME IN THE CHEMICAL WORLD"**

For Your Small & Bulk Requirements Of:

**Morpholine * Phosphorous Trichloride * Tributyl Phosphate**
**Phosphorous pentoxide * Phosphorous Oxychloride**
**Mono Ethanolamine * Tri Ethanolamine * Diethanolamine**

PLEASE CONTACT:

**S.I. CHEMICALS & TRADING CO. PVT. LTD.**

65, Bombay Samachar Marg, Sonawala Building, 2nd Floor, Bombay - 400 023
Phone : 286 34 18, 286 12 36. Cable "SICORPOBOM" Telex : 11-5028 CHEM - IN

---

**OCTOATE * NAPHTHENATE DRIERS**
**LIQUID PVC STABILIZERS**

More than 15 years of production and supply experience to customers satisfaction all over Inida R & D Department always available to supply products tailor-made for the customer. Prompt delivery as per customers schedule.

Please Contact

aryavart

**ALSO AT**

TRICHUR : Vimla Bldg., Rice Bazar. Ph. 25878
NAGPUR : Panchsheel Textile Traders, Ph. 32667
DELHI : A.K. DUTT & CO. Ph. 738051
CALCUTTA : S. Mitra, Ph. 377028

**Aryavart Chemicals Pvt. Ltd.**

Post Box No. 33,
317 & 319 Arenja Corner, Plot No. 71,
Sector No. 17, D.B.C. Vashi,
New Bombay 400 705.
Tel.: (0215) 670384/671410
Gram: CHEMSFIELD, Vashi, New Bombay 400 703.

---

For Your Regular Requirements of:

Acetonitrile
Acetyl chloride
Acrylamide * Acrylonitrile
Allyl Alcohol
Alpha Picoline
Butyl Cellosolve * B.H.T.
Chloroform * Cyclohexane
Di Methyl Formamide
Di Methyl Sulphoxide
Epichloro Hydrine
Ethylene Dichloride
Formic Acid -- 99% & 85%
Hydroxylamine Hydrochloride
Hydroxylamine Sulphate
Iso Amyl Alcohol
Iso Butyl Alcohol
Iso Butyric Acid
Iso Propyl Alcohol
Lithium Hydroxide
Magnesium Oxide
Malonic Acid
Methyl Cellulose 4000
Methyl Cellosolve
Methyl Formate
Morpholine
Methyl Ethyl Ketone
N. Butyl Amine * N. Butyric Acid
N. Heptane * N. Propyl Amine
Quinoline * P.C.B.A.
Para formaldehyde 84-85%
Perchloro Ethylene
Petroleum Ether 40-60%, 60-80%, 60-95%
Secondary Butanol
Sodium Methoxide
Soya Lecithin Powder
Thiourea
Tri-Chloro Ethylene, T.E.G.
Tertiary Butyl Alcohol
Xanthone * Zinc dust

H.P.M.C. 5 CPS, 15CPS, 50CPS, 606 CPS

Please Contact: **Gurukrupa Chemical Corporation**

Gopal House, 2nd Floor, 7/9, Kumbharwada Cross Lane, Veer Vithaldas Chandan Street, BOMBAY 400 003.
Phones: 321020/339968/344937 Residence: 6124644/6122149

Acrylo-Aceto Nitrile
Allyl Alcohol
Allyl Chloride
1,4 Butane Diol
B.H.A.
B.H.T.
T.B.H.Q.
Sorbic Acid
Calcium Propionate
Cresyllic acid
Coconut Di Ethanolamide (Imported)
Chloro Hexedine Gluconate 20%
Calcium Chloride
Carbon Disulphide
Caprolactum
Carbitol/Butyl Carbitol
Cyclohexanone/nol
Cyclohexane
Cyclohexylamine
Mono- Di-Tri Ethanolamine
Mono- Di-Tri Ethyl Amine
Iso Propyl Amine 99%
Iso Propyl Myristate (Imported)
Iso Octane 99%
N. Heptane 99%
N. Hexane 99%
N. Pentane 99%
Ethylene Chlorohydrine
Ethylene Diamine
Lithium Hydroxide
Lithium Carbonate
Oleyl Alcohol
Nitro Methane
Moly-Disulphide
PVP K-30
Pot. Carbonate
Sod. Hypochlorite Soln. (8 to 10%)
Solvent Naphtha (Light & Heavy)
T.H.F.
T.E.G. (Indian/Imported)
Thioglycollic Acid
Calcium Hydroxide (Extra Pure)
Tert. Butanol
Distilled MEG

Contact:

**HARIBHAI JEEBHAI & CO.**

22, S. Gandhi Marg, (Princess Street), Bombay 400 002.
**Tel. No: Off.: 312116-315999-254950-253945 Resi: 6207314-6207791**
**Telex: C/o. 011-3185 ABC IN**

**WITH MODVAT**

DIAM ORGANIC CHEMICAL INDUSTRIES (P) LTD.

Manufacturer Offers (Ex-Stock)

**Ethyl Cellosolve (Ethylene Glycol Mono Ethyl Ether)**
**Ethyl Carbitol (Di-Ethylene Glycol Mono Ethyl Ether**
**Higher/Glycol Ethers (High ERBP) For Brake Fluids**
**Tri Ethanolamine (85%) Technical Grade**

Contact:
*Bombay Office:* Crescent Chambers, First Floor, Tamarind Street, Fort, Bombay 400 023.
**Tel.: 272341, 276239, 272339**
**Tlx.: 011-85644 TAPS IN**
**Cable: 'CHERRY', Bombay 400 036.**

Available From Ready Stock:
IN SMALL PACKINGS OF 450 ML / 5 Lit / 30/35 Lit & 50 Lit/Kg.

Acetone
Amyl Acetate
Acetic Acid Glacial
Aniline Oil
Butyl Alcohol - N
Butyl Acetate
Benzene (N.G.)
Carbitol
Carbon Tetra Chloride
Chloroform Cellosolve
Cellosolve Acetate
Cyclohexanone
Cyclohexylamine/D.E.P.
Di Acetone Alcohol
Di Butyl Phthalate
Di Octyl Phthalate
Di Ethanolamine
Di Ethylene Glycol
Di Methyl Formamide
Epichlorohydrine
Ether Petroleum (40/60)
Ether Petroleum (60/80)
Ether Petroleum (80/100)
Ether Petroleum (100/120)
Ethyl Acetate
Ethylene Glycol
Ethylene Dichloride
Formaldehyde 37%
Glycerine Iso Propanol
Hydrazine Hydrate
Liquid Paraffin Light
Liquid Paraffin Heavy
Methyl Ethyl Ketone
Methyl Iso Butyl Ketone
Methylene Chloride
Mono Chloro Benzene
Mono Ethanolamine
Mineral Turpentine
N. Hexane/Octoic Acid
Octyl Alcohol/O.D.C.B.
Oleic Acid Commercial
Oleic Acid Pure
Pine Oil
Perchloro Ethylene
Propylene Glycol
Phosphoric Acid
Poly Glycol 200/400/600/800
Potas Hydroxide Pellet
Silicone Oil (All Grades)
Silicone Grease
Sodium Silicate Natural
Solvent Naphtha Heavy
Solvent Naphtha Light
Sorbitol/Styrene Monomer
Tertiary Butanol
Trichloroethylene
Toluene (N.G.)
Tri Ethanolamine
Trichloro Benzene
o-Xylene

Please Contact:

**MEMBA CHEM CORPORATION**

19, M.J. Co-op. Housing Society Ltd., Ground Floor, 187, Shamaldas Gandhi Marg (Princess Street), Bombay 400 002.
**Phone: 316261/252255**

**SPECIALITY CHEMICALS**

- Ethylene Oxide Condensate
- Propylene Oxide Condensates And Co-polymers
- SLES, TEALS, Cocodiethanolamide
- Synthetic Lubricants for high temperature service
- Industrial Liquid Detergents
- Tailor-made Spin Finish Oils and Coning Oils for Synthetic Fibre/Yarn
- Speciality Chemicals tailor-made to Customer's requirements

**UNITED PESTICHEM & NONIONICS PVT. LTD.**

"AHURA", 84 Sion Road, Sion East, Bombay 400 022.
Phone Nos.: 4074295/96; 4073355; 4091752

AVAILABLE BEST QUALITY WITH EXCISE MODVAT FACILITIES

LACTIC ACID (SPAIN)
SODIUM LACTATE SOLN. 60% & 70% w/w

SODIUM CITRATE I.P.
DISODIUM HYDROGEN CITRATE B.P.
POTASSIUM CITRATE I.P.
SODIUM ACID PHOSPHATE I.P.
SODIUM CITRATE ANHYDROUS
NICKEL SULPHATE
NICKEL NITRATE
DIPOTASSIUM HYDROGEN CITRATE
CITRIC ACID ANHYDROUS
TRICHOLINE CITRATE SOLN. 65% w/w
IRON CHOLINE CITRATE SOLN. 66% w/w
CHOLINE DIHYDROGEN CITRATE SOLN. 50% w/w
COBALT SULPHATE
AMMONIUM MOLYBDATE

Manufactured by:

**M/s. SUNIL CHEMICALS**

*ADMN. OFFICE:*
*63, Shamaldas Gandhi Marg,*
*Devkaran Mansion,*
*1st Floor, Bombay 400 002.*

*FACTORY*
*Parekh Industrial Estate,*
*Chandansar Road, Virar (East),*
*Dist. Thane (M.S.)*

Phones: (Bombay) 2864003, 2864086, 2864226. Residence: 6230699

f you DON'T want to STARVE TOMORROW
CONSERVE TODAY
UniOil

UNIQUE OILS INDIA LTD
CAN SHOW YOU THE WAY

Their State-of-the-art drum reconditioning plant at Tarapur can bring back your old drums to AS NEW condition and give new lease of life to them. The process is cost-effective too. A large number of users of drums are reaping the benefits. WHY NOT YOU???

Their sophisticated used oil re-refining plant can purchase all your used lubricating oil for scientific re-refining. Give your used oil to them and prevent its use for spurious purposes. Contribute towards saving country's foreign exchange.

Contact:

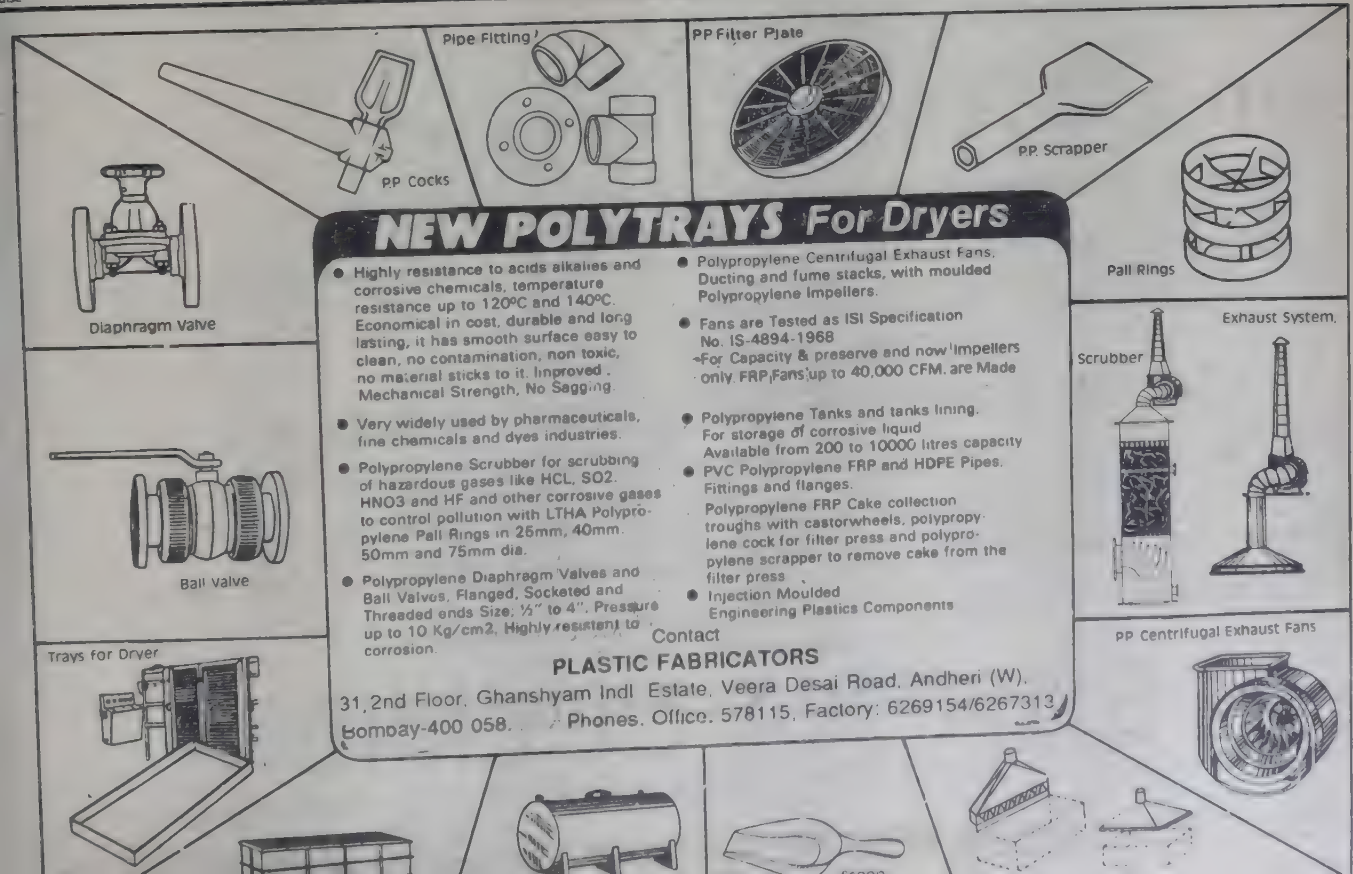
**Unique Oils India Limited**

UniOil

Regd Office: Arvind Chambers, 2nd Floor, (Gouri Studio Comp.),
194, Andheri-Kurla Road, Andheri (E), Bombay-400 069
Tel: 6347210/6320100 Telex: 011-79292 UOIL IN • Fax: 009122-636 4654

Factory: Plot M-4, MIDC Industrial Estate,
Tarapur, Dist. Thane, Maharashtra, Telex: 0132-236 UOIL IN Tel: 2892

ulse



**NEW POLYTRAYS For Dryers**

- Highly resistance to acids alkalies and corrosive chemicals, temperature resistance up to 120ºC and 140ºC. Economical in cost, durable and long lasting, it has smooth surface easy to clean, no contamination, non toxic, no material sticks to it. Improved. Mechanical Strength, No Sagging.
- Very widely used by pharmaceuticals, fine chemicals and dyes industries.
- Polypropylene Scrubber for scrubbing of hazardous gases like HCL, SO2. HNO3 and HF and other corrosive gases to control pollution with LTHA Polypropylene Pall Rings in 25mm, 40mm. 50mm and 75mm dia.
- Polypropylene Diaphragm Valves and Ball Valves, Flanged, Socketed and Threaded ends Size; ½" to 4". Pressure up to 10 Kg/cm2, Highly resistant to corrosion.
- Polypropylene Centrifugal Exhaust Fans. Ducting and fume stacks, with moulded Polypropylene Impellers.
- Fans are Tested as ISI Specification No. IS-4894-1968
  For Capacity & preserve and now Impellers only. FRP Fans up to 40,000 CFM. are Made
- Polypropylene Tanks and tanks lining. For storage of corrosive liquid Available from 200 to 10000 litres capacity
- PVC Polypropylene FRP and HDPE Pipes. Fittings and flanges.
  Polypropylene FRP Cake collection troughs with castorwheels, polypropylene cock for filter press and polypropylene scrapper to remove cake from the filter press
- Injection Moulded Engineering Plastics Components

Contact

**PLASTIC FABRICATORS**

31, 2nd Floor. Ghanshyam Indl Estate. Veera Desai Road. Andheri (W).
Bombay-400 058. Phones. Office. 578115, Factory: 6269154/6267313

ATTENTION CONSUMERS AND EXPORTERS
AVAILABLE QUALITY PRODUCTS

**2:5 Di Chloro Aniline** (Scarlet GG Base)
**2:5 Di Chloro Nitro Benzene**
**Ortho Chloro Aniline**
**Para Nitro Phenol**
**Sodium Para Nitro Phenol**

Contact Manufacturers:

**GEMCHEM INDUSTRIES**
**MEDICS LABORATORIES**

74, Matru Smruti, Road No. 4, Scheme No. 6, Sion (East), Bombay 400 022.
**Phones: 4077431/32/33 • Telex No.: 011-73254 ALAB IN**

---

For Your Regular Requirements Of:

**ZINC ASH**
**ZINC HYDROXIDE**
**ZINC DUST**
**BRASS ASH**
(SUITABLE FOR MFG. ZINC SULPHATE)
**ZINC OXIDE**
(OFF COLOUR)
**COPPER OXIDE/ASH**
(SUITABLE FOR MFG. (COPPER SULPHATE ETC.)

Please Contact:

**METAL TRADING CORPORATION**

Dadbhawala Sadan, 384/9, Telang Cross Road,
Opp. Syndicate Bank, Matunga, Bombay-400 019.
Phone: (Off.) 4373708, 4374206; (Resi.) 6124047, 6151621
Gram: 'HIMETCHEM', Matunga, Bombay-400 019.

---

FOR YOUR BULK REQUIREMENTS OF:

**Naphthol ASG**
**T.R.O. (Turkey Red Oil)**
**Sodium Lauryl Sulfate**
**Sodium Lauryl Ether Sulfate**
**Triethanolamine Lauryl Sulfate**
**TEBA (Phase Transfer Catalyst)**

Please Contact Manufacturers:

**SWAPNA CHEMIE**

25/160, D.N. Road, Fort, Bombay 400 001.
**Telephone: 2047713**

OTHER PRODUCTS OFFERED: TRIACETIN, CABS, MOLINEX COMPUTERS AND MEDIA PRODUCTS

REASONABLE PRICES
AND EX-STOCKS

EDTA ACID 99 ± 1%

LIQUID EDTA (50 C.V. & 100 C.V.)

DTPA 99 ± 1%

DTPA SOLUTION 40%

NITRILO TRI ACETIC ACID (N.T.A.)

CONTACT
MANUFACTURER

**OM NEELKANTH**
**CHEMICALS INDIA PVT. LTD.**
FACTORY :
S. NO. 204, KARANNAGAR - 382 727
DIST. MEHSANA (N.G.) PHONE : 2129
(KADI - DIRECT DIAL CODE 02769)

OM NEELKANTH CHEMICALS

OUR NEW HEAD OFFICE ADDRESS :

5, ANAND CHAMBERS, 2ND FLOOR,
NEAR STATE BANK OF INDIA, OPP. "SHILP",
NAVRANGPURA, AHMEDABAD - 380 009.
PHONE : 408360 GRAM : NEELCHEM
TELEX : 121-6539 TRCE IN
ATTN : OM NEELKANTH

Please Contact For Prompt Supplies Of:

ANHYDROUS
AMMONIA GAS

IN 5/7/9 TONNES CAPACITY ROAD TANKERS AND IN 40/50/60 Kgs. CAPACITY CYLINDERS
ALSO AVAILABLE LIQUOR AMMONIA

**AMMONIA SUPPLY CO. (Bombay)**
22-B, Bombay Samachar Marg, Above George Restaurant, 2nd Floor, Fort, Bombay 400 023.
**Phones: Office: 271914, 272245 & 274526 Residence: 6239566 Godown: 4307473 & 4300205**

**AMMONIA MARKETING CO. (BOMBAY)**
125, III Phase, Peenya Industrial Area, Bangalore 560 058. **Telephones: 394402, 394379**

**ASCO ENGINEERING CO.**
Sodagar Ice Factory Compound, University Road, Baroda 390 002. **Telephones: 328603, 328239**
Plot No. 2926, Phase-I, G.I.D.C., Vapi 396 195

**AMMONIA SUPPLY CO.** * **ASCO ENGINEERING CO.**
18, New Colony, Model Basti (Near Filmistan Cinema) New Delhi 110 005. **Phones: 776142, 779644**

*Also Available*

NEW CYLINDERS FOR AMMONIA & CHLORINE
DULY APPROVED BY C.C.E. NAGPUR AND CERTIFIED BY B.I.S. NEW DELHI
AND ASSOCIATES ALL OVER INDIA

ALWAYS AVAILABLE

HYFLOSUPERCELL
DICALITE
CITRIC ACID
PECTIN

MELAMINE
PHENOL
PARAFORMALDEHYDE
BUTYL ACRYLATE

LITHOPONE
HYDROGEN PEROXIDE
FORMIC ACID
TARTARIC ACID

Phone:
Resl: 6442063
Office: 345506/347879

Please Contact:
**B.I. MEHTA**

Telex No.
C/o. 11-75617 MMCB IN
Fax: 00-91-22 325620
Attn.: B.I. Mehta

2-B, Ganga Vihar 94, Kazi Sayed Street, Bombay 400 003.

**WE ALSO BUY/SELL REP-EXPORT HOUSE LICENCE**

We are pleased to offer our own

**TOLUENE**

(Nitration and Pure Grade)
(in barrels or bulk)

To actual consumers having all valid licences.
Kindly write with full details to:

**M/s. SAVIORAY LABORATORIES PVT. LTD.**

Post Box No. 5527,
Dadar, Bombay 400 014.

We Offer Best Quality And Competitive Rates

**AMMONIUM THIOCYANATE**
**POTASSIUM THIOCYANATE**
**SODIUM THIOCYANATE**
**ETHYLENE THIO-UREA**
**ZINC CARBONATE**
**ACETAMIDE**

Please Contact Manufacturers:

**M/s. PARAS CHEMICALS**

A 2/4, G.I.D.C. Vapi, Gujarat Bombay Res. Tel. No. 6493549 Bombay Telex: 011 79303 FC IN

FLUORINE BASED CHEMICALS
Manufactured with SWISS/GERMAN Knowhow
Available Ex-stock

ODIUM ALUMINIUM
FLUORIDE (CRYOLITE)
MMONIUM BIFLUORIDE
LUOBORIC ACID
OTASSIUM BIFLUORIDE

POTASSIUM FLUORIDE
SODIUM SILICO FLUORIDE
SODIUM MONOFLUORO PHOSPHATE
SODIUM BIFLUORIDE
SODIUM FLUORIDE

COPPER, LEAD, TIN FLUOBORATES
HF ACID (ELEC. GR)
HF ACID (ANHYDROUS)
HF ACID (40%, 60%, 70%)

Can also manufacture any other special Fluorine Chemicals to your specification.
Please Contact Manufacturers:

TAMILNADU FLUORINE AND ALLIED CHEMICALS LTD.

*egd. Office:*
No. 5-C, II Street, Dr. Radhakrishnan Road,
Mylapore, Madras 600 004.
Tel.: 846138, 846071. Tlx.: 041-6463 TFAC-IN

*Works:*
Plot No. 14, SIPCOT Industrial Complex,
Cuddalore 607 003, Tamil Nadu.
Tel.: 2321, 2121. Tlx.: 0462-204 TFCL-IN

AGENTS

M/s. HINDUSTAN CHEMICAL CO.
77B, Juhu Supreme Centre, Gulmohar Road,
Bombay-400 049
Tel.: 6205464, 6204121

M/s. RANA DYES CORPORATION,
Sringeri Mutt Complex, 1st Floor,
K.V. Temple Street, Sultanpet,
Bangalore 560 053. Tel.: 77417

M/s. RAM-NATH & CO.
123, Angappa Naick Street, Madras 600 001.
Tel.: 580623, 585843, 837773, 431006.
Tlx.: 041-7399 RANA IN

M/s. DECCAN ORGANICS,
1-8-158/160, Plot. 10, P.B. No. 1503
Prenderghast Road, Secunderabad 500 003
Tel.: 844857, 840729. Tlx.: 0425-6535

---

ROHAN DYES AND INTERMEDIATES
(AHMEDABAD)
FOR YOUR REQUIREMENTS AS PER INTERNATIONAL STANDARD TOP IN QUALITY

- GAMMA ACID
- G. SALT
- R. SALT
- META UREIDO ANILINE HCL
- K. ACID
- AMIDO G. SALT
- S.P.C.P.
- S.P.M.P.
- 2.5 DICHLORO S.P.M.P.
- P.M.P.
- SULFANILIC ACID (TECH. GRADE)
- SULFANILIC ACID (PURIFIED)
- SCHAFFER'S ACID
- 4-NAP
- 4-NAPSA

AND SHORTLY INTRODUCING MANY NEW ITEMS & A RANGE OF DIRECT, ACID AND REACTIVE DYES

ROHAN DYES & INTERMEDIATES

OFFICE :
189, NEW CLOTH MARKET,
AHMEDABAD-380002.
PH. : 368171 & 360758, FAX : 272-346412
TELEX 1216942 JITM IN

BOMBAY OFFICE :
2ND FLOOR, PUSHPAWATI BLDG NO. 2,
CHANDANWADI, GIRGAON ROAD,
BOMBAY-400002
TEL. 256740, 298224 TLX 01182383

FACTORY :
115, GIDC, PHASE I, VATVA,
AHMEDABAD-380045.
PH 831131-2, 833771 & 834469

DISTRIBUTOR :
RONAK ENTERPRISES
B.2, RAJDEEP PARK FLATS,
BALIAKAKA RD., AHMEDABAD
TEL. 396719 & 395475

Available Regularly at Competitive Rates Ex-Stock/Ex-Factory

**SODIUM NITRITE * SODIUM NITRATE**

Mfrd. by: M/s. SONIL Div. of M/s. CHEMCROWN (INDIA) LTD.

**RIFAMPICIN I.P. (COMPACTED)**
**IBUPROFEN I.P.**
**PHENOBARBITONE I.P.**
**2-AMINO-4-CHLORO PHENOL**
**OCTYL ACETATE**

Mfrd. by: M/s. CUREKRAFT CHEMICALS (I) PVT. LTD. Divn. of M/s. CHEMCROWN (I) LTD.

**PARA TERTIARY BUTYL PHENOL -- PTBP**
**DITERTIARY BUTYL PARA CRESOL -- DBPC (BHT)**

Indenting Agent of M/s. Balmer Lawrie & Co.

Please Contact:

**CHEMCROWN INDIA LTD.**
D/3, Poonam Apartments, Dr. A.B. Road, Worli, Bombay 400 018.
Phone: 4928386/4928737 * Telex: 011-71758 CHEM IN
CALCUTTA OFFICE: 295652/290218 * DELHI OFFICE: 3317051/3316666 * KANPUR OFFICE: 211641/211825 * MIRZAPUR OFFICE: 3580

**SOYA LECITHIN**
**CITRIC ACID**
**MONO SODIUM GLUTAMATE**
**PECTIN**
**COCOA POWDER**
**BHA**

Contact

**SESU TRADING CORPORATION**
4th Floor, Sai Chambers, 367/369, Narsi Natha Street, Bombay 400 009.
Phone: 320832/326402 Telex: 11-76387 Cable: TRASESU

For your requirements of

AMMONIUM BIFLUORIDE
AMMONIUM FLUORIDE
AMMONIUM FLUOBORTE
SODIUM BIFLUORIDE
SODIUM FLUORIDE
SODIUM SILICO FLUORIDE
SODIUM FLUOBRATE
SODIUM CRYOLITE
POTASSIUM BIFLUORIDE
POTASSIUM FLUORIDE
POTASSIUM FLUOBORATE
POTASSIUM SILICO FLUORIDE
POTASSIUM TITANIUM FLUORIDE
CHROMIUM CARBONATE
CHROMIUM FLUORIDE

Please Contact Manufacturers

**RAJ FLUORINE & CHEMICALS**
D-6, Simit Shopping Centre, Char Rasta, G.I.D.C., Vapi - 396 195 (Guj)
Tel: 1419 Resi: 2030

WE TAKE EXTRA CARE • INDIAN GUM INDUSTRIES LTD •

*QUALITY * RELIABILITY * EXCELLENCE*

*Available Ex-Stock*

**PROPYLENE GLYCOL USP (DOW)**

**Adipic Acid**
**Methylene Chloride**
**Hydroxyl Amine Sulphate**
**2-Chloro Propionic Acid**

**REQUIRED FOR EXPORT**

**Norfloxacin USP**
**Niacin BP**
**Ibuprofen**
**Schaeffers Acid**
**Pyrantal Pamoate USP**
**6-Nitro-1-Diazo-2-Naphthol-4-Sulphonic Acid**
**(2:5 Dichloro-4-Sulfophenyl)-3-Methyl-5-Pyrazolone)**

**Indian Gum Industries Limited**
(Recognised Export House)
51-A, Maker Chamber IV, Nariman Point, Bombay 400 021
**Telex: 2139 IGUM. Tel: 243711-12-30-60**

ATTENTION MANUFACTURERS OF DYESTUFFS, DYE INTERMEDIATES, BULK DRUGS AND BULK DRUG INTERMEDIATES

Regularly Available on Competitive terms

**ACETANILIDE OF ULTRA PURE QUALITY**

INTRODUCING SHORTLY

ANILINE OIL
N,METHYL,N,HYDROXY ETHYL ANILINE
OXYETHYL NITRO ANILINE
N,N,DIHYDROXY ETHYL META TOLUDENE
N,ETHYL-N-HYDROXY ETHYL ANILINE
N,N,DIHYDROXY ETHYL ANILINE
N,N,DIHYDROXY ETHYL META CHLORO ANILINE

Contact Manufacturers

**VASUDHA CHEMICALS PVT. LTD.**
501, Sai Ashish A-Wing, Balrajeshwar Road, Mulund (W), Bombay 400 080.
Tlx: 011-71030 DELT IN
Fax: 91-22-5603680
Tel: 5604382/5613921

**CHANGE OF ADDRESS:**

**SUNIL CHEMICAL INDUSTRIES**

Authorised Distributors:

**RAMA PETROCHEMICAL LTD.**

**OSWAL PETROCHEMICALS LTD.**

**OUR NEW ADDRESS IS:**
Opp. B.M.P. Equipment, (16-B),
Netaji Palkar Road, (Old N.S.S. Road),
Narayan Nagar, Ghatkopar (West),
Bombay 400 086.

**Phones: 5112459, 5112460, 5146980, 5146981, 5146982, 5146983, 5147885**
**Residence: 5126597, 5127649, 4121896, 4121915, 6441713, 6441821**

---

Contact:

**Area Distributors:**
**H.P. LUBRICANTS**
**Authorised Distributors:**
**HINDUSTAN PETROLEUM CORPORATION LTD.**

For your small & bulk requirements of:

**Mineral Turpentine (Solvent 2445)**
**Food Grade Hexene**
**Solvent 1425 (S.B.P.)**
**Lube & Industrial Oils**

Contact:
21, Creative Industrial Estate, N.M. Joshi Marg, Near Chinchpokli Station,
Bombay 400 011.

**Phone: 378833, 891717, 396868, 394040**

# Chemical Weekly

VOL. XXXV AUGUST 21, 1990 NO. 50

## CONTENTS

Heralding the 21st Century: The dawn of the natural gas era in the Asia-Pacific region — T.P.S. RAJAN 41

Chemarena — S.L. VENKITESWARAN 43

### IN THE NEWS

BICP urged to revise price of alcohol to Rs. four 46

Acetic acid price hike on anvil 46

Revised product mix for Haldia 46

Haldia Petrochem project: Two RPG companies to participate 48

Two aromatic plants likely in Eighth Plan 49

Caustic soda plant for Vedaranyam 50

Vizag cracker: UB Group willing to self finance project 50

ICMA announces awards for 1989 53

NOCIL reports better results 54

BPCL implementing MTBE project 61

Bharat Salt goes on stream 63

Rama Petro to make 2-EH 64

34th AGM of CAMA: Antop Hill Warehousing on: all hurdles cleared 70

All India Federation of Chemical Merchants constituted 75

### OIL AND NATURAL GAS SCENARIO

Gujarat's case for hike in crude oil royalty considered 62

Joint-sector Karnal refinery: Soviet turnkey offer rejected 68

Surplus gas sought for southern region 77

Cabinet clearance for Kandla-Bhatinda pipeline soon 77

PIB approves development of Neelam oil field 80

Soviets urged to supply more crude 81

Oil probe pact with USSR 83

### PLASTICS NEWS

PIL to market polyacetals 48

Aftermath of Iraqi aggression: plastic raw material suppliers stop booking 52

Commodity plastics: prices spurt 52

New distributors for Du Pont appointed 62

### FERTILISER NEWS

RCF bags excellence award 65

Dual pricing for fertilisers mooted 66

FAI proposes changes in pricing norms 66

### PHARMACEUTICAL CAPSULE

Drug formulation prices: fresh appeals likely 56

Drug price control to stay: Government 56

Drug SSIs seek exemption from DPCO 60

### ON THE METALLURGICAL FRONT

Steel Authority to raise Rs. 4,600 crores on its own 69

Low-grade ore as feedstock: Fresh interest in TN sponge iron project 82

New mineral policy: 13 strategic items reserved for exploration by Govt. 84

Aluminium extrusions industry in for a boost 86

### REGULAR FEATURES

Frankly Speaking: Process Technologies — An Efficiency Index — Dr. O.P. KHARBANDA 87

Spotlight on Biotechnology & Life Sciences 91

New Products 97

Indian Standards 101

Science Briefs 107

### INTERNATIONAL SPECTRUM

News from Abroad 111

Biotechnology 113

Environment 116

Technological Scene Abroad 118

News about New Projects 119

News from Japan 120

### MARKET INFORMATION

Bombay Chemicals Market 125

Bombay Dyes Market 130

Delhi Market 132

Madras Market 133

Shipping News 134

Materials Imported/Exported 137

*Publishers:*
**SEVAK PUBLICATIONS**

*Editor - Publisher*
**R. RAGHAVAN**

*Advertisement Manager*
**N.R. RAJAGOPALAN**

*Administration/Circulation*
**VIJAY RAGHAVAN**

*Editorial & Administrative Office:*
306, Shri Hanuman Industrial Estate
G.D. Ambekar Road, Wadala,
BOMBAY 400 031.
Phones: 4120743/4131198.
Telex: 011-76053 CWLY IN

*Madras Office:*
Room No. 9, Wellingdon Estate,
3rd Floor, 24, Commander-in-Chief
Road, Madras 600 105.
Phone: C/o. 471659.
Telex: 041-6290 CWLY IN.

*Printed at:*
Sevak Publications,
25, North Mada St., Thiruvanmiyur,
Madras 600 041.

Fast Print Service,
307/308, Shri Hanuman Indl. Estate,
G.D. Ambekar Road, Wadala,
Bombay 400 031.

**Subscription Rates:**
**(Inclusive of Postage)**
India: Rs. 400.00
Foreign: US$ 175.00 (Air Mail)
US$ 75.00 (Sea Mail)

***Subscription charges payable in advance in favour of SEVAK PUBLICATIONS***

**HALTERMANN**

Pure Hydrocarbons &
Aromatic Hydrocarbons
Petroleum Ethers
Printing Ink solvents
ASTM Reference Fuels
N-Pentane
N-Hexane
Iso-Octane
Solvent Naphtha
Diaryl Disulphide
Rubber Reclaiming Agent

Contact:

CHIKA

**CHIKA LIMITED**
Bhupati Chambers, 13, Mathew Road, Bombay 400 004.
Phones: 8113456/1457 Cable: "DYECOLD" Telex: 11 75562 and 11 75534
**Branches**
**AHMEDABAD:** Ashram Road, **CALCUTTA:** 36, Ganesh Chandra Avenue
**MADRAS:** 122. Mount Road. **NEW DELHI:** 25/1. Asaf Ali Road

CHEMICAL
WEEKLY

VOL. XXXV AUGUST 21, 1990 NO. 50

## HERALDING THE 21st CENTURY - 63

# The dawn of the Natural Gas era in the Asia Pacific Region

**(Continued from the previous issue)**

**Asean Pipe Plan.** A French-Italian consortium is carrying out a preliminary study on the proposal to build the 10billion (£6.09 billion) natural gas Trans Asean Pipeline TAPL).

The new gas pipeline would represent a key infrastructure sset and help develop the region generally and enable the SEAN countries to diversify their energy consumption away rom oil.

The consortium members are Gaz de France, Total, Agip, Agip Petroli, Snam and IMI.

The new gas pipeline would link up Thailand at Bangkok, to Brunei, Kuala Lumpur, Singapore, Jakarta and Manila in the Philippines.

The pipeline would be nearly 5000 km long and have a minimum capacity of 1.16 bcm a day.

The consortium -- which is said to be open to EC countries -- has been asked by the Association of South East Asian Nations (ASEAN) -- EC Energy Management and Research Centre to prepare the terms of reference on the project in time for the meeting of the Asean Senior Officials on Energy Cooperation in June.

If the terms of reference are accepted, the consortium will then be asked to carry out a feasibility study for the project.

It is reported the EC could help finance the project though most of the backing will come from the Italian and French governments.

**Japan -- US LNG Bid?** Companies from Japan and the US are investigating a possible joint venture with China to sell lng from the South China Sea to Japan.

If the venture is deemed feasible, sources said, Nissho Iwai Corporation, Atlantic Richfield Co. and the China National Offshore Oil Corporation, will form a company that could sell 1.5 million metric tons of natural gas a year to Japan, some time after 1995. Plans to proceed with the project depend on whether Nissho Iwai can secure term-contract buyers among Japan's utilities and gas companies.

No end users have committed to the project so far. Officials involved in the project declined to comment on the current status of sales talks. A first-stage feasibility study for the project was completed last May. But the project was suspended after the violent military crackdown.

Nihon Keizai Shimbun, a Japanese economic newspaper said talks of resuming the project came up amidst signs of an easing in Western economic sanctions against China after its supression of the pro-democracy movement.

**Cheap gas is key to WA industry.** Cheap gas supplies to produce electricity could hold the key to the State Government's hope of attracting energy intensive industries to Western Australia.

A new study prepared by the WA Energy Policy and Planning Bureau has found that gas offers the best hope of providing low-cost electricity to both industrial and domestic customers.

"It is clear that if sufficient low-cost gas is available then there is significant scope for electricity supply costs in the future to be below that from coal-fired plants," the study said.

"Costs from future gas turbine plant offer the potential to significantly reduce WA electricity tariffs and to allow WA to compete in the Australian and world market for energy intensive industrial developments."

Power charges have emerged as a major component in the cost of these developments many of which use huge quantities of electricity.

At present WA is handicapped because its power charges are among the dearest in Australia.

The report found that the main advantage of gas over coal was the vastly cheaper capital cost of gas turbine equipment. Savings of up to 66 per cent have been estimated in the cost of gas equipment.

The general consensus is that the oil supplies will tighten over the medium to long term, bringing higher prices. Natural gas could play a crucial role in our efforts to develop a more resilient and flexible energy mix to prepare for
possibility. The situation therefore calls for even gre
efforts to make optimal use of the qualities of this outsta
ing energy resource.

As the background circumstances affecting our ene
needs change, the role played by natural gas is expecte
grow. At the same time Japan is preparing cooperative st
egies for the Asia-Pacific region in respect to indivic
energy sources, including the Pacific Coal Flow Expan
Initiative and the Second Electrification Drive.

The natural gas industry has not yet prepared a comp
hensive plan for the new era which the Asia-Pacific reg
is about to enter. Japan's role in this field is expected to
wide and profound. Our primary requirement would no
a monolithic development programme but one which is
ersified and flexible enough to conform to the circumst
ces in each individual country, while duly emphasising
three key factors which will determine the future succes
the programme -- capital, technology, and manpower.

**T.P.S. RAJ**

(**Source:** *Gas World*, April 1990).

# HEMARENA

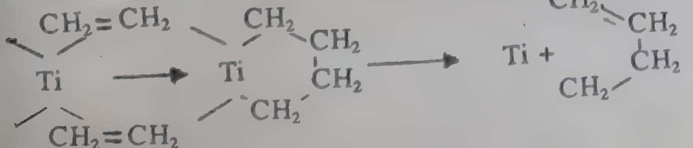
## . VENKITESWARAN

# Dimerisation of Ethylene

imerisation of ethylene to Butene-1 is now a successful ess developed by Institute of Petrol of France. In India a plant of 10,000 TPA is included in the MGCC com- now nearing completion. Butene-1 is being made from utanol by PIL for meeting their requirements as comono- for their HD Polyethylene. The rise of Butene-1 has been to the development of LLDPE for which also it is a ionomer. Though $C_6$ and higher olefines also figure as ionomers, Butene-1 is the most widely used and average wth in the eighties is said to be 24%. It is mostly recov- d from the naphtha cracker butylenes but the other n- tene isomer and isobutylenes have to be separated. The rket for butene-1 as per end use over the eighties is as der:

| | 1981 | 1987 Mt/y. | 1990 t | 81-90 % rise | Annual Growth % |
|---|---|---|---|---|---|
| or | | | | | |
| LDPE | 36 | 210 | 244 | 68 | 24 |
| DPE | 27 | 41 | 48 | 13 | 7 |
| oly- butene-1 | 12 | 13 | 25 | 7 | 8 |
| hemicals | 36 | 36 | 42 | 12 | 2 |
| otal | 111 | 300 | 359 | 100 | 14 |

The IFP process for Butene-1 from ethylene named "Alphabutol" is presented in **HP of March 1990**. The pro- cess also uses Titanium organo metallic compound as cat- alyst but of valence III. The new catalyst system avoids isomerisation of butene-1 to butene-2 and hence the need for costly fractionation. The first Alphabutol plant of 3000 tonnes was started in 1987 in Thailand and a second unit of 50 MT per year is in Saudi Arabia the same year. The soluble titan- ium complex catalyst acts in a different way -- concerted coupling of two molecules of ethylene on a titanium atom (to form a TiV cyclic compound) which then decomposes to Butene-1 by an intra molecular ß-Hydrogen transfer as shown below:



The reaction is in liquid phase and catalyst is deactivated by continuous injection of an organic compound downstream. Isomerisation in butene-2 is less than 100 ppm. and the side reactions eliminated by the operating conditions and choice of catalyst. Perpass conversion of ethylene is limited to 80-85% under 22 to 27 bars pressure and conversion to butene-1 is over 93%. The temperatures are 50 to 55°C and pressures of 22 to 27 bars with no solvent required and all equipment in mild steel. The ethylene (vapour) is fed into the reactor through a gas distributor. The heat of reaction is removed by a circulation heat exchanger. The reactor effluent is withdrawn from the bottom, catalyst deactivated and evaporated in two phases using a thin film evaporator for 2nd phase and the residue goes for incineration. The catalyst results from two components namely a "package" of compounds containing Titanium and a commercial organo-aluminium compound. The two components in a butene solution are injected separating into the reactor through the heat exchanger recycle line. The vapours from evaporation are condensed and distilled to get the product and unconverted ethylene is recycled.

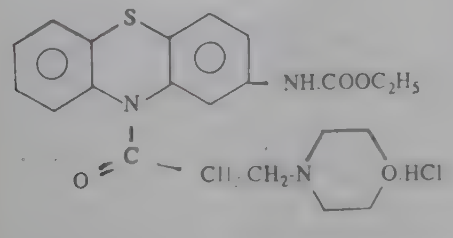
The economic data for the process are given as:

| | Kgm/tonne of Butene-1 |
|---|---|
| Ethylene (99%+) | 1095 |
| Catalysts | 1 |
| $C_6$+ | 73 |
| Catalyst residue | 3 |
| Electricity | 50 |
| Water cooling, m³ | 90 |
| Steam LP | 0.7 tonnes |
| Investment US $ end 1989 for B/L 30 MT/year | 167 $/tpy. |

The alphabutol process is certainly an attractive way for butene-1 but questions either diversion of a small part of polymer grade ethylene or the use of $C_4$ fraction in case of naphtha cracking complex may arise for consideration. Incidentally if ethyl alcohol is available the process with its dehydration to ethylene looks attractive.

# Soviet Drug for US market

For a change, USSR is able to offer a valuable cardiac drug developed by them to the USA. And this through Du Pont Pharmaceuticals, who have got the FDA aproval for the same. Moricizine Hydrochloride is the drug which is claimed to be effective for serious arrythmias without any known side effects.



The trials were initiated in USA as early as 1974 but value was realised only last year when there were far t many deaths with the use of other drugs for arrythn —ensainide and flacianide. Moricizine was tested out at t National Institute of Health for Cardiac Arrythmia Suppr sion Test. The other two drugs continue to be used with str warnings as directed by CAST results. Side effects were lo at 7% of patients as compared to 30% with the other tw The drug acts by modulating electrical firing of cells in Pu kinje fibres which cause ventricles to contract. There is potential to provoke arrythmias also which is perhaps le in morcizine.

(*C.E. News*, 2/

# Cutting down on $CO_2$ in atmosphere

Increase in carbon dioxide, the largest of the "Greenhouse" gases, threatens environmental disaster if we continue with the increasing use of fossil fuels and the burning down of forest land. This is recognised as of global concern and steps for reducing the level of emissions are being discussed. Now a new idea has emerged, that of increasing the $CO_2$ intake by the vast oceans through higher growth of phytoplanktons and macroalgae (seaweed). This has become a hot subject and discussion in National Research Council meetings in USA.

John H. Martin of Moss Landing Marine Laboratories, Calif, has proposed an intriguing hypothesis that increase in iron content of some large expanses of the ocean could lead to more marine organisms and $CO_2$ uptake because iron levels were found inadequate for their growth. Analysis of air trapped in ice cores from Greenland and Antartica showed preindustrial levels of $CO_2$ in the atmosphere (280 ppm).

Human activity has raised this level to 350 ppm but it was also found that the level dropped to 200 ppm during the peak of the glacial age 18000 years ago. This fall represents about 170 billion tonnes of carbon less in the atmosphere. Has this drop played any role in the last global ice age and was $CO_2$ a factor in causing ice age? The hypothesis is that oceanic processes were primarily responsible for the drop in $CO_2$ during ice ages -- a kind of "bilogical pump" to take up the $CO_2$ from atmosphere by the chlorophyll containing marine algae. There are various factors which affect this intake and one is the availability of iron, a critical micronutrient. It is postulated that offshore waters get the iron from atmospheric dust blowing from the continents. There is ve little of such dust over the Antartic ocean. Both nitrate ar phosphate are said to be abundant in the waters of Antart and generates the rich ecosystem of phytoplankton, krill, fis seals, penguins etc. The near shore waters may be receivi iron from seafloor but this may not be the case in the of shore waters. Is it possible to get similar abundance of phy oplankton in the offshore Antartic waters by injection of iro To support this thesis it is found that while coastal wate have 7.4 nano mol iron per kg. t is only 0.16 nano mol offshore waters. One unit of added iron it is estimated c increase the carbon content of sea water by a factor 10,000.

There are critics of this theory which is considered too si plistic and feel that it could be an environmental risk unknown magnitude. The estimated cost for such a trial $150 million and also $CO_2$ reduction could be achieved less cost. It is also pointed out that the study has to sprea over 20 to 30 years to show that the food-chain effects a minimal and $CO_2$ reduction levels as projected.

The proposals for study on the lines of iron enrichme of Antartica are to be examined by the NRC. If 2 gigato of carbon are removed from the atmosphere in this simp way at a cost of a billion dollars a year, the experiments a worthwhile. 4 to 6 billion tonnes of carbon are now release into the atmosphere every year from fossil fuels and t $CO_2$ levels are steadily rising as the intake by the veget ble kingdom or in the oceans are not adequate.

((Ref. *C.E. New*

For Competitive Imports of Chemicals, Pharmaceutical
Raw Materials and Particularly for the Following Items

**Acetic Anhydride**
**Chloroform**
**Methyl Dichloro Acetate**
**Dichloro Acetyl Chloride**
**Chloro Acetyl Chloride**
**Maleic Anhydride**
**Succinic Acid**

PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

**CHEMET**

HEAD OFFICE:
Taj Building, 1st Floor, P.B.No. 195, 210, Dr. D.N. Road, Bombay: 400 001
Phones: 2043803/4/5/6/7 Fax. No. 2048854
Cable: DEGUCHEM Bombay Telex: 11-3229/11 4631 DGKM IN

CALCUTTA OFFICE:
Sharma House, 3rd Floor, 1/2 Lord Sinha Road, Calcutta-700 071
Phones: 447306 ■ 446155, Cable: DEGUCHEM Calcutta, Telex: 21-33 25 DGKN IN

MADRAS OFFICE:
10, Kondy Chetty Street, 1st Floor, P.B. No. 1709, Madras 600 001. Cable: DEGUCHEM, Madras
Phones: 582447 ■ 587617 ■ 580796 Telex: 41 7554 DGKM IN

DELHI OFFICE:
214, Hans Bhavan, Wing No. 1, Bahadurshah Zafer Marg, New Delhi - 110 002
Phones: 3311373 ■ 3319787 ■ 3319791 Cable: DEGUCHEM New Delhi,
Telex:31 65921, DGKM IN.

HYDERABAD OFFICE:
905/2, 9th Floor, Babukhan Estate, Basheerbagh, Hyderabad-500 001.
Phone : 242318, Telex: 0425 - 2188, DGKM IN.

# BICP urged to revise price of alcohol to Rs. four

The distillery industry is seeking a evision of alcohol price to Rs. 4 per litre. In their submissions to the Bureau of Industrial Costs and Prices (BICP), distilleries have said the existing BICP-fixed price of Rs. 2.26 is highly unrealistic. Some distilleries are yet to espond to the BICP questionnaire.

According to All India Distillers' Association (AIDA), one reason for BICP fixing "unremunerative" price in the past has been that it has been assum-ng 70 per cent capacity utilisation of distilleries, whereas actual capacity utilisation has been around 50 per cent. "Keeping in mind the requirement of alcohol within the country for all purposes, there is also no possibility of utilistion of capacity registering an increase in the years to come," AIDA has said in communication to BICP.

AIDA has claimed that BICP did not take into account numerous other input cost escalations during the last seven years while revising the price of industrial alcohol in 1987 and 1989. It has estimated that the cost of steam has increased by more than 115 per cent, coal and electricity too have become dearer, it has pointed out.

Some distilleries have also cited increased expenditure involved in setting up effluent treatment plants as a reason for seeking a price rise. Many in the industry find it puzzling. Installation of effluent treatment systems, it is pointed out, generates a lot of methane which, when burnt as a fuel, significantly reduces the energy costs of distilleries. It is surprising that AIDA is silent on this fact in its representations to BICP.

What makes AIDA arguments suspect is the fact that a leading distillery in Uttar Pradesh has said in its submission to BICP that its cost of production is less than Rs. 2 a litre. This distillery has already installed the mandatory effluent treatment facilities and is burning the byproduct methane to fire its boilers. AIDA, incidentally, has made a commitment to the ministry of environment that all member units will set up primary treatment plants by July 15. Many member distilleries, however, are yet to honour this commitment.

Sources in the alcohol-based chemical industry said any increase in the alcohol price will affect the growth of the industry which in recent months has started exporting many alcohol-based chemicals like ethyl acetate and monochloroacetic acid. They feel that at this nascent stage of its development, the industry requires protection. A price rise at this juncture will upset the calculation of major investment proposals like SM Dyechem's project in Pune district. More production of these chemicals using alcohol, a renewable, agro-based feedstock, will mean saving scarce petroleum products like naphtha and gas, it is pointed out.

It is also pointed out that the BICP price notified by the government is flouted by most states. The existing official price, for example, is Rs. 2.26 a litre, but the prevailing prices are Rs. 3.15 in Maharashtra, Rs. 4 in Gujarat, Rs. 3.35 in Tamil Nadu and Rs. 2.85 in Uttar Pradesh. Consuming units have gone to court complaining non-adherence of the official price.

---

## ACETIC ACID PRICE HIKE ON ANVIL

---

The price of acetic acid, an industrial chemical which goes into the manufacture of textile auxiliaries, dyes and pharmaceuticals, is in for a rise, according to sources in the consuming industries.

Manufacturers confirm the likelihood of a price rise, and attribute it to power cuts in Gujarat, Karnataka, Tamil Nadu and other states which have affected production. The industry has an installed capacity of 1.5 lakh tonnes against a demand of about 80,000 tonnes. Acetic acid is currently quoted at Rs. 8.20 a kg ex-factory. The international price is around $600-650 a tonne cif.

Because of reduced production, the demand and supply are almost evenly matched. Imports are not feasible, even against advance licence.

The following are the major consuming segments: acetic anhydride 30,000 tonnes, PTA 12,000 tonnes, textile auxiliaries 10,000 tonnes, dyes 15,000 tonnes, pharmaceuticals 10,000 tonnes, monochloroacetic acid, 5,000 tonnes and miscellaneous 2,000 tonnes.

---

## REVISED PRODUCT-MIX FOR HALDIA

---

The National Front government at the Centre has cleared the letter of intent for the Haldia Petrochemicals Limited project which was revised following the change in the joint sector partner to Tata Tea from R. P. Goenka and associates.

Announcing this in Calcutta on Aug 3rd, the state finance minister, Mr. Aasim Dasgupta, said the updated and augmented size of the Haldia Petochemicals project had been accepted by the Union government and the letter granting the letter of intent to the joint sector, West Bengal Industrial Development Corporation - Tata Tea venture had come through on Aug 3rd. The resident commissioner for West Bengal would bring the letter of intent to Calcutta.

The revised letter of intent provides for an increase of the ethylene to be produced from the naphtha cracker to 300,000 tonnes from 100,000 tonnes. Propylene to be produced by HPL has been raised to 1.5 lakh tonnes from 55,000 tonnes, butadiene production will also be raised to 53,000 tonnes from 21,000 tonnes.

**Attention!**

**DYESTUFFS/DYE INTERMEDIATES/BULK DRUG RUBBER CHEMICAL MANUFACTURERS!**

**"Happy Days Are Here Again"**

**DHANBAD CHEMICALS LTD.**

**Offering**

**ANILINE** **(Bulk and Drum)**
**NITROBENZENE**

**At Special Prices to our regular customers**

Please rush your enquiries/orders to

**Please Contact**

**UPHAR PROJECTS LTD.**

**(People who care for your progress)**

HEAD OFFICE:
Podar Chambers, 4th Floor, S.A. Brelvi Street, Bombay 400 001
Phones: 2860596 ■ 2863611 ■ 2863676 ■ 2863783 ■ 2863900
Telex: 0118-5495 PRIA IN ■ 0118-6556 PRIA IN ■ 0118-2472 PODR IN

BRANCHES
— HYDERABAD OFFICE —
Prashanthi Commercial Complex, 6-9-30/6 to 8/B, 2nd Floor, Basheerbagh,
Hyderabad - 500 029 Phone: 236068

— DELHI OFFICE —
Flat No. 8, 10th Floor, Akash Deep Bldg., Barakhamba Road, New Delhi - 110 001
Phones: 3314512 ■ 3310413

— BANGALORE OFFICE —
Devatha Plaza, 131/132, Residency Road, Bangalore - 560 025 Phone: 214027

— MADRAS OFFICE —
5-J Century Plaza, 560-562 Mount Road, Teynampet, Madras 600 018.
Phone: 451597 ■ 451031 Telex: 041-8809 PRIYA IN

— CALCUTTA OFFICE —
"LORDS", 3rd Floor, 7/1, Lord Sinha Road, Calcutta 700 071
Phone: 222378 ■ 222379 ■ 228015 ■ 226367 ■ 300765

### HALDIA PETROCHEM PROJECT

# Two RPG companies to participate

Contrary to the speculation that Mr. R.P. Goenka might not participate n the Haldia Petrochemical project folowing his replacement by the Tatas as a partner in Haldia Petrochemicals Ltd., RPG Enterprises has floated two companies, Petrochem International and Zeon Synthetics, with the clear intention of taking part in Haldia's down-stream projects. RPG Enterprises proposes to commission the projects, to be taken up by these companies, ahead of HPL.

With the recommendation of the West Bengal Government's Director of Industries, RPG Enterprises has already applied to the Union Government for a letter of intent for the projects.

In an application to the state government, Mr. Sanjiv Goenka, the younger son of Mr. R.P. Goenka, has expressed his desire to set up the two new units at Haldia, based on indigenous and some imported feedstock. The application says, "since the projects are of relatively shorter gestation compared to the HPL project, and in order to show some quick results for the development of the state, it is the intention of RPG to commission these projects ahead of HPL".

The first company, Petrochem International, will make polybutenes (10,000 MTA) and maleic anhydride (10,000 MTA) while the second unit, Zeon Synthetics, will produce ABS resins (20,000 MTA) and petrochem resins (15,000 MTA) as feedstocks. The two companies will initially start manufacture with feedstock independent of Haldia's products. The Haldia Petrochemical products will be used as and when they become available. The companies will have an integrated provision to receive feedstock from HPL when it will be ready to supply them.

RPG Enterprises, in its application to the state government, has demanded seven items from HPL. They include butadiene (5,000 MTA), styrene (10,000 MTA), C-4 raffinate (35,000 MTA), CBFS (50,000 MTA), and pyrolysis gasoline (30,000 MTA). RPG's application to the state government says: "The five items are absolutely necessary to support the two new projects as well as to cater the needs of the existing carbon black unit at Durgapur."

Officially, however, the RPG group was allowed three items by the Haldia board — butadiene, styrene and C-4 raffinate. That the RPG presence in Haldia will be fairly strong is borne out by the fact, that they have asked for several more items. In fact, there are indications that the group had discussions with the chief minister for setting up more new projects. The group has also asked for ethylene (25,000 MTA) and propylene (28,000 MTA) from HPL. Whether the Tatas would agree to part with such items in future would be interesting to watch. Details of the investments in the new projects will be communicated to the state government by the group in due course.

## PIL TO MARKET POLYACETALS

Polyolefins Inds. Ltd. (PIL) has signed and filed with the government a technical collaboration agreement for manufacture and marketing of polyacetal copolymers with Hoechst Celanese Corp. (HCC) of USA (a wholly owned subsidiary of Hoechst AG of Germany), whose product is currently marketed under the brand name "Celcon".

HCC is one of the largest manufacturers of polyacetal copolymers worldwide and plants based on technologies licensed by HCC and their partners account for over 70 per cent of world production of all such resins. The resins are speciality polymers in the family of engineering plastics — chemically known as polyoxymethylene (POM). The linear structure and high crystallinity of acetal copolymer accounts fo good physical properties. Its chemica structure, molecular chains with randomly arranged comonomer units, give it high resistance to thermal and oxidative degradation, very high resistanc to chemicals e.g. organic solvents, fuel and strong alkalies.

The copolymer is a very useful material for making precision parts which economically replace conventiona metals like aluminium, brass and othe non-ferrous alloys. Due to good combination of electrical and mechanica properties even under unfavourable conditions of heat and sub-zero temperature, acetal copolymers are used in mechanical, automotive engineering precision engineering, electrical and electronics engineering.

## MRF's NEW UNIT

MRF Limited is planning a new unit which will add Rs. 20 crore to its annua turnover. The company is setting up a new unit at Gummidipoondi, in Tami Nadu which will manufacture 2000 tonnes of speciality surface coatings MRF is transferring a part of its 10,000 tonnes capacity sanctioned under the letter of intent given to its Cuddalore unit. The project will cost Rs. 150 lakhs which will be financed through a Rs. 600 lakh investment already approved by the government for Cuddalore.

## VAM ORGANIC TO MAKE SILICA

Vam Organic Chemicals plans to go into manufacture of silica through the acquisition of a stake in an Uttar Pradesh based company called Insilco Ltd Insilco is in the process of implementing a project for the manufacture of specialised spray dried silica. At present i has an authorised capital of Rs. 2250 lakhs but a paid up capital of Rs. 2000 lakhs. Vam Organic plans on acquiring Rs. 765 lakhs worth of shares at par as the promoters contribution.

# o aromatic plants likely in Eighth Plan

e Union Minister for Petroleum Chemicals, Mr. M.S. Gurupadas-, said at Madras on August 12 that inistry had sought the inclusion of aromatics projects in the Eighth and hoped that the Planning Com-ion would agree with the view. One t would be at Manali, near Madras, e joint sector, while the other would e up at Saleempur in Uttar Pradesh, eby solving the problem of where ocate the project.

ddressing a press conference at the dence of the Tamil Nadu Chief nister Mr. M. Karunanidhi, Mr. Gur-daswamy said the Manali plant, nsored jointly by the Madras Refin-es and SPIC, was at an advanced ge of consideration and the first stage arance from the Public Investments ard had been obtained. Rs. 18 crores d been sanctioned already for pre-oject activities.

Asked specifically which project ould be recommended by the Minis-y if the Planning Commission cleared nly one of them, the Minister replied I hope both projects will come through nd the different stages of operation can e worked out''. Pressed further, Mr. Gurupadaswamy would not commit imself but said "the Manali plant equires no budgetary support and the oreign exchange component can be met by export of finished products''.

Giving details of the Manali aromatics project, he said it envisaged an investment of Rs. 1,356 crores with a debt-equity ratio of 3:1 involving an equity of Rs. 339 crores and public borrowings and loans for Rs. 1,017 crores. The financial structure envisaged an investment of Rs. 176.28 crores from the promoters, Rs. 33.9 crores from the foreign collaborators who had also been identified and public equity participation of Rs. 128.82 crores.

### Mobilise debentures

It also proposed to mobilise debentures for Rs. 261.18 crores, Rs. 362.72 crores from financial institutions, Rs. 75 crores from banks, commercial borrowings and credit supplies of Rs. 159.05 crores. The Minister explained that the Manali project had been pending since February 1987 and his Ministry was giving it "highest priority and consideration''. He hoped this would set at rest the misgivings on the project in Tamil Nadu.

Mr. Karunanidhi, thanked the Petroleum Minister on behalf of Tamil Nadu. The vice-chairman and president of SPIC, Mr. A.C. Muthiah, complimented the Tamil Nadu Chief Minister, Mr. M. Karunanidhi, for his efforts in bagging the aromatic project for Tamil Nadu. The project would provide a fillip to industrial growth in the State, Mr. Muthiah said.

### Oil situation serious

Commenting on the oil situation in the country, Mr. Gurupadaswamy said "the situation is very serious and the conflict in the Gulf has made it even more critical, because we import oil from Kuwait and Iraq among other countries''. As the foreign exchange situation was also serious, he said it would become difficult for the country to import at the current rates. The price of crude, which ruled at about $15 a barrel recently, went up to $18 a barrel and the OPEC countries had put it up to $21, though the open market rates now stood at $24.

Asked if the Centre planned to increase the prices of petroleum products, the Minister said "that is not the problem; we cannot buy in the world market because of the foreign exchange crunch''. He explained that at present the country had five weeks stock but after that the pinch would be felt. "We have to look around for replenishment from elsewhere, though it is a problem confronting many other countries as well.'' Mr. Gurupadaswamy emphasised the need for curtailing use of oil in the country and explained that the recent steps taken by the Government were only recommendatory.

**For the most competitive CIF price of**

**Iodine**
**Dichlone**
**Acrylamide**
**Thiourea**
**Beta Naphthol**
**and other chemicals**

**Please Contact:**

**Mr. DHAIRESH K. SANGHVI**
**M/s. KANTILAL SANGHVI & CO.**

3rd Floor, Union Co-operative Insurance Bldg.,
23, Sir Pherozeshah Mehta Road,
BOMBAY 400 001.
**Phones: (Office): 2870836/2873217/2873628**
**(Resi.): 4226850/4229086**
**Telex: 1185725 EXIM IM** **Gram: EXPIM, Bombay**
**Fax: (22) 2874153**

### VIZAG CRACKER

## UB group willing to self finance project

The UB group has come forward to set up its Rs. 800 crore naphtha cracker unit at Vizag without applying for foreign exchange or approaching the financial institutions for funds. Mr. Vijay Mallya, UB group Chairman, told newsmen recently that the group had the letter of intent for the unit and would execute the project with its own resources. The group had the option of setting up the unit as a stand alone project or along with certain downstream projects, which had also been applied for, "We hope these will come through", he said. At least 18 to 24 months would be needed before the naphtha cracker unit was through, he said. With the commissioning of the UB Petroproducts Ltd. in Madras on August 12, the UB group is determined to start the UB elastomers project by 1992. "We will then be all set up to execute the naphtha cracker unit", he said.

Mr. Mallya said the group's polymers division had finally turned the corner. But the present import duty structure on polystyrene was crippling its profits. "This policy helps foreign companies to dump their petrochemical by-products in the country while domestic manufacturers using molasses are adversely affected. It also results in a drain of valuable foreign exchange. How long can the country afford this luxury?" he asked. He said that his company was prepared for a Bureau of Industrial Costs and Pricing (BICP) study on the issue. He felt that the import duty had to be reviewed soon, especially in view of the mounting import bill on petroleum products and to manage the critical balance of payment position.

In any case, the UB group is determined to go ahead with its expansion plans for the polymers division for the manufacture of new styrene and polystyrene products. An investment of Rs. 120 to 130 crores is underway on the project, he said. Mr. Mallya said the UB group which was emerging as one of the fastest growing conglomerates in the country with annual turnover exceeding Rs. 1400 crore in several diversified business areas involving over 50 manufacturing units all over the country had, achieved exports earnings of Rs. 100 crore. He strongly advocated the need for a complete overhaul of the Monopolies and Restrictive Trade Practices Act and the Foreign Exchange Regulation Act and a drastic reduction in the import duty on capital goods if the country were to overcome its delicate balance of payments position and progress industrially.

Mr. Mallya said the compar
Rs. 7.5 crore bulk drugs project
manufacturing ranitidine hydrochlor
and ibuprofen located at Tumkur, n
Bangalore, was going according
schedule and will be commissio
during this financial year.

The UB group is making an issue
3.36 lakh 12.5 per cent secured conv
ible debentures of Rs. 300 each to ra
Rs. 10.08 crore for financing the bu
drugs project and to partly meet
normal capital expenditure. The rig
issue, which opened on August 6, clo
on September 5.

### CAUSTIC SODA PLANT FOR VEDARANYAM

The Tamil Nadu Government h
decided to set up a Rs. 65 crore pla
for the manufacture of caustic soda
Vedaranyam area at Thanjavur distri
An official release said the facto
would be set up jointly by TIDCO ar
the Tamil Nadu Petroproducts Limite
The release said originally the prop
sal was to start a soda ash manufactu
ing plant in Vedaranyam.

But it was later found that soda as
was being produced in enough quant
ties and that it would be difficult
get enough power for the plant. Henc
it was decided to start a caustic soc
plant.

"34TH YEAR OF SERVICE"
A RELIABLE & DEPENDABLE HOUSE FOR CHEMICALS & SOLVENTS PARTICULARLY FOR

**CAUSTIC SODA LYE**
**(In Tanker Loads)**

**Consumers Kindly Contact**
**PURCHASE & SALES EXCHANGE**

345, Samuel Street, Bombay 400 003.
Telephones: 327129/341105/6887582
Tlx.: 011-74476 ATTN.: 0398 Fax: 287-1441 ATTN.: 0398
011-74498 ATTN.: 0398 287-2220 ATTN.: 0398
ESTD.: 1955
Associates: TEJ ENTERPRISES

FOR YOUR IMPORTS AT COMPETITIVE CIF PRICES

Barium Carbonate
Sodium Nitrite
Beta Naphthol
Picramic Acid
Dinitro Sec. Butyl Phenol
2,4-Ditertiary Butyl Phenol
2,6-Ditertiary Butyl Phenol
Epichlorohydrine
4-Oxydiphenylamine
Melamine
Glyoxyllic Acid 50%
Pyridine Pure 2°

Sodium Picramate
Dimethyl Sulphoxide
Dimethyl Formamide
Lactose (Ex-NCZ)
o-Chloro Benzaldehyde
Iodine
Nitromethane
Cysteamine HCl
Acetic Anhydride
Pivaloyl Chloride
Methyl Chloroformate
Dimethyl Carbonate
Guaiacol
Cyclohexanone

N-Chlorosuccinimide

Please Contact for further details:

S. AMIT & CO.

A TRUSTED NAME FOR IMPORT OF YOUR CHEMICALS
105, Neelam Centre, "A" Wing, Hind Cycle Road,
Worli, Bombay 400 025.
Phones: 4934627-28/4933310
Cable: "DULICTOL"
Telex: 011-76877 CMIT IN
011-74486 AMIT IN
Fax No.: 22-494950-4
Madras Office: Queens Court, 134, Montieth Road, Madras 600 008.
Phones: 860172/866942
Hyderabad Office: 8-3-215/7 (First Floor), Srinivasa Nagar Colony (West),
HYDERABAD-500 890.
Phone: 35110

Our Associates: M/s. CHEM AMIT

### AFTERMATH OF IRAQI AGGRESSION

## Plastic raw material suppliers stop booking

Leading global suppliers of plastic raw materials and petrochemicals to India including Sabic, Mobil, Exxon and Phillips Petroleum have either suspended fresh bookings or drastically cut down furture offers.

Even Korean and Yugoslavian companies have joined their western counterparts in suspending fresh commitments following the bullish trend and uncertainty which has disrupted the global petrochemical scene in the wake of Iraqi aggression. Although all the Saudi plants are operating as usual, some shippers have expressed reluctance to ply the vessels, affecting even imports contracted months ago.

Though Mobil, Exxon and Mitsubishi plants in Saudi Arabia are still in operation, there is a distinct possibility of key expartriates fleeing the country in the event of a war involving Saudi Arabia. Half of India's polymer requirements are met through imports. Out of this, Saudi Arabia accounts for almost 95 per cent of imports of high density polyethylene (injection moulding and HM grade) and linear low density polyethylene. Given the current uncertain situation, trade sources expect prices to flare up by 20 to 30 per cent, which may level off to 15 to 20 per cent at a later stage assuming the crisis is diffused, calming the current speculative contagion.

Ethylene spot prices have jumped to almost $ 800 a tonne from $ 650 a tonne before Iraq invaded Kuwait. It is too premature to speculate, but if the trend aggravates, it may even hurt the prospects of forthcoming petrochemical projects of Reliance Petro and Finolex, according to some in the industry. An Indian agent who started importing material from an Iraqi plant only a few months ago said his shipment was held up at a Kuwaiti port. The only silver lining on the horizon is substantial purchases contracted by public sector Indian Petrochemicals Corporation Ltd. (IPCL) which should come to the rescue of plastic processors consuming LDPE and LLDPE. Both materials were booked at good prices before the crisis at approximately $ 730 a tonne. India imports almost 10,000 tonnes of HDPE and 4,500 tonnes of polypropylene a month.

The Middle East crisis has come at a time when inventory levels were low in India. Imports almost came to a standstill in the wake of steep increase in import duty in January this year. Landed cost worked out so prohibitive that some importers even cancelled existing contracts. Following strong representations from processors, duties were brought down in late February. Since then, not much imports took place because of the declining trend in petrochemical prices, with everyone waiting for prices to fall further. Material piled up in bonded ware-houses, and many an Indian trader suffered losses. The market was just picking up from mid-June, and the global prices were also firming up, on the eve of the Iraqi aggression.

---

### COMMODITY PLASTICS: PRICES SPURT

Prices of all commodity plastics have shot up in the local market following the withdrawal of fresh bookings by foreign suppliers.

High density polyethylene (HDPE), which was quoted around Rs. 35 a kg by first week of Aug, is now priced at Rs. 40 and above in the open market. What is worse, all polymers have become scarce and many local suppliers have stopped supplies.

Plastic processors, the small-scale ones in particular, are perturbed over the development. Local suppliers
Bombay, have said, that they are
having material. Some suppliers h
reportedly clarified that they war
make up for the losses suffered du
the past few months. "All traders h
ing on to stock stand to benefit th
to Saddam Hussain," one proce
remarked.

The current crisis has come at a t
when inventory levels were already l
It may be recalled that all imports
come to a standstill following the st
increase in customs duty from Janu
5. On February 27, the governm
brought down the duties. As a gl
market was on a downtrend, not m
import took place.

---

### ALEMBIC CHEMICAL

Alembic Chemical Works Comp
has fared well during the year en
March, 1990. It has earned a good op
ating profit of Rs. 11.08 crores aga
Rs. 7.46 crores in the previous
months on turnover of Rs. 127.87 cr
against Rs. 85.87 crores in the
period.

The provision for interest charge
significantly up to Rs. 679.15 la
from Rs. 390.47 lakhs in the
period, leaving a gross profit
Rs. 428.73 lakhs against Rs. 355
lakhs.

After depreciation (Rs. 231.75 la
against Rs. 152.95 lakhs), taxat
(Rs. 33 lakhs against Rs. 32.60 lak
the after tax profit is down to Rs. 163
lakhs from Rs. 169.65 lakhs in the
period. With investment allowa
reserve claiming substantially less
Rs. 39 lakhs against Rs. 87 lakhs,
net profit is larger at Rs. 124.98 la
against Rs. 82.65 lakhs in the
period.

It has stepped up the dividend to
per cent from 15 per cent absorb
Rs. 65.89 lakhs against Rs. 61.77 la
in the past period.

CIAL HONOUR FOR PROF. SHARMA

# ICMA announces awards for 1989

ne Indian Chemical Manufacturers ociation have pleasure to announce ICMA Awards for 1989.

C.M.A. ACHARYA P.C. RAY ARD FOR DEVELOPMENT OF CHNOLOGY INDIGENOUSLY to pin Laboratories Ltd., Bombay for its standing contribution in the development of technology for the commer- l production of Vitamin $B_6$ for the t time in India involving complex ht step organic syntheis.

A special citation to National Chem- l Laboratory, Pune for pioneering the allenging task of synthesising Vita- in $B_6$ and collaborating with Lupin aboratories Limited in transfer of this chnology successfully for commercial roduction.

I.C.M.A. AWARD FOR NOVEL ND COMPLEX TECHNOLOGY IAVING A WIDESPREAD IMPACT N CHEMICAL INDUSTRY AND ECONOMY to Hindustan Polymers, a JB Group Company, Visakhapatnam or its unique achievement for the first ime in commercialising the production of Ethyl Benzene using one step non-conventional alkylation process involving dilute Ethyl Alcohol and Benzene in presence of specially structured zeolite catalyst developed by the National Chemical Laboratory (NCL), Pune.

A special citation to National Chemical Laboratory, Pune for its valuable contribution in developing environmentally cleaner one step process for manufacture of Ethyl Benzene resulting in the reduction of cost of raw materials, energy and capital cost.

A special citation to United Catalysts India Limited, Bombay for its outstanding role in developing the structured zeolite catalyst based on the process know-how of NCL Pune for Albene Technology.

I.C.M.A. AWARD FOR EXPORT OF CHEMICAL PLANTS AND FOR ENGINEERING SERVICES RENDERED OVERSEAS to Grasim Industries Limited, Nagda (M.P) for successfully exporting complete viscose rayon fibre plant to Thailand and also providing technical know-how and consultancy services for chemical plant projects such as acrylic fibre, sulphuric acid, effluent treatment etc. to a number of countries.

The other I.C.M.A. Awards for the year have been passed over.

---

## SPECIAL HONOUR TO PROF. M.M. SHARMA

The I.C.M.A. has decided to institute an Award for Individual for Outstanding Contribution to the Chemical Industry for Human Welfare. The Award will comprise a plaque, a sum of Rs. 1 lakh and a citation.

The first award will be conferred on Prof. M.M. Sharma, Director of the Department of Chemical Technology, University of Bombay and Fellow of Royal Society for his meritorious services to the Indian Chemical Industry over many years and for his original contribution in the field of CHEMICAL/ENGINEERING SCIENCES of practical importance to industry and recognised internationally.

This is the first occasion for ICMA to honour an individual scientist for his distinguished achievements as a teacher and as a researcher in the innovative technology development in the chemical industry.

The awards would be presented at the Annual General Meeting of the Association to be held at Calcutta sometime in September 1990.

FOR MOST COMPETITIVE CIF OFFERS FOR:

**Beta Naphthol**
**Hydroquinone**
**Tobias Acid**
**and other Chemicals**

Please Contact:

**M/s. K. SANGHVI & CO.**

308, 'Gulab' 3rd Floor,
237, P.D 'Mello Road,
Bombay 400 001.

Phone: Office: 2612232/2610711 Resi: 8128473/8226451
Telegram: KEYSANGHVI Telex: 11-73516 KSC IN
Fax No.: (22' 2618970

# NOCIL reports better results

**Financial Performance**

Sales proceeds for the year 1989-90 were Rs. 446 crores compared to the previous year (15 month period) sales of Rs. 450 crores. Better performance has been attributed to better realisations from petrochemicals, higher volumes in agrochemicals and increase in exports.

Net operating profit before interest and depreciation has been up from 88.87 crores to 95.62 crores. After providing for interest depreciation and taxation, net profit has been up to 42.24 crores from 40.74 crores.

During the year the company has changed method of valuation of stock in process and finished stocks of petrochemical products resulting in increase in valuation by Rs. 80 lakhs. Profit noted above is consequently higher by that amount. There was a drop in production of petrochemicals, mainly due to power failure and mechanical problems particularly in the first quarter of the year. On the agrochemicals front, record production of monocrotophos and cypermethrin were achieved.

Increased manufacturing costs were on account of increase in basis excise duty on naphtha, chlorine prices. Depreciation of the rupee also contributed to cost rises.

**Export**

There was a significant jump in export from 13.6 crores in the previous year to Rs. 34.8 crores. The main earnings being chemical intermediates & polyester staple fibre.

The companies export activities have been spread to Indonesia, Italy, Japan, Poland, South Korea, Thailand, US and West Germany. The company is also exploring markets for polypropylene woven sacks, fatty alcohol ethoxylates, glycol ethers and thermoplastic rubber compounds.

**Expansion Project**

Letter of intent for the expansion p ject of ethylene from 63,000 tons p annum to 3,00,000 tons per annum h been received in November 1988. Es mated cost is around 1800 crores 1989 price index). Necessary appro from the Maharashtra Pollution Contr Board has been received. Finally, Sh has fully backed NOCIL's propo with considerable funding.

Sizeable export commitment has be made to cover the operating expens for exchange and cost of servicing fo eign equity and borrowings.

**Research & Development**

The company's R & D has bee active in providing technology suppo to its ongoing operation in petrochem icals through a continuous effort energy conservation and pollution co trol.

CONTACT FOR MOST COMPETITIVE CIF PRICE FOR

Aniline Oil/Adipic Acid
Beta/Gamma Picoline
Beta Naphthol/D.O.P.
Caustic Potash/D.E.S.
Dimethyl Dichloro Silane
Ethyl/Methyl Glycol
H. H. 80%/Pyridine
H.A.S./Sodium Metal/Phenol

Amino/Theophylline Anhy.
Chloroquine Phosphate
C P Base/Sorbic Acid/Pot. Sorbate
3 Cyano/4 Cyano Pyridine
Erythromycin Thiocyanate
Haldoperidol/Captopril
Prednisolone/Primidone
Spironolactone/Neomycin Sulphate

TITANIUM DIOXIDE - ANATASE/RUTILE

SATYAN PHARMACEUTICALS PVT. LTD.

Diamond House, 491-493 Kalbadevi Road, Bombay 400 002.
Tel: 25 00 50 & 31 62 50 Telex: 0118-5210 SPL IN

BR. OFFICE: 114 Thambu Chetty Street, Madras - 600 001.
Tel: 51 39 67 & 51 08 51

SC

Star Chemicals

FOR YOUR IMPORT REQUIREMENTS OF

**Diclofenac Sodium**
**Chlormezanone**
**Chlorozoxazone**
**Diprophylline**
**Diclofenac Potassium**
**Oxethazine**
**2,6-Dichloro Aniline**
**Furfuryl Alcohol**
**Cysteamine HCl**
**Nitromethane**

**And for other Chemicals, Pharmaceuticals & Intermediates**

PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

MADRAS OFFICE:
D-4, 2/36 RAMS SQUARE
2, Village Road
MADRAS 600 034
**Tel: 864430/8250097**
**Tlx: 041 25164 STAR IN**
**FAX: 044 473762**

HYDERABAD OFFICE:
'NALANDA' Unit No. 7
6-3-649, Somajiguda
Hyderabad 500 482
Tel: 210288
**TLX: 0425-6131 STAR IN**

OUR LOCATION DOES NOT MAKE ANY DIFFERENCE TO OUR COMMITMENT TO SERVE YOU

### DRUG FORMULATION PRICES

## Fresh appeals likely

Even as the ministry of petroleum and chemicals is working on the clearance of price review applications for drug formulations that have been pending since October 1989, indications are that there may be fresh appeals against the new price fixations.

The government is apparently structuring the new prices on the basis of packaging material cost ceilings fixed in 1979, notwithstanding numerous protests by the industry associations over the past few months. Although new ceilings were worked out by the ministry internally, in May 1989, they are yet to be notified.

In fact, sources say that the Drug Price Review Committee has been processing price review applications after taking into account the new packaging material ceilings, but has been asked by the ministry to rework the prices after rolling back the ceilings to the 1979 levels. "This will reduce our realisations by 10 to 15 per cent," says one manufacturer. "If producers are not allowed realistic prices, they will be forced to use packaging materials of inferior quality".

Industry sources say that between 1979 and now, prices of packaging materials used in injectibles, syrups and ointments have increased between 50 to 75 per cent, while aluminium foil used for tablets is costlier by 25 to 50 per cent. "Overall, during the last five years alone, there has been a 50 per cent increase in costs of packaging materials", says the chairman of a leading Bombay-based pharmaceutical company.

Conversion norms, however are being allowed on the basis of the recommendations made by the Dr. D. K. Sankaran committee that submitted its report in February 1989. The committee had suggested a phased increase in the norms, with an initial 50 per cent increase over the 1979 levels. But industry spokesmen say that this will impact prices by a mere five per cent or so, as conversion costs account for only about 10 to 15 per cent of drug prices.

Manufacturers allege that even while computing raw material costs in the process of price fixation, the ministry is pegging them at levels lower than those recommended by the Bureau of Industrial Costs & Prices. As a rule, the ministry does not disclose the costs of raw materials and packaging materials it has taken into account while fixing prices.

---

### DRUG PRICE CONTROL TO STAY: GOVT.

The petroleum and chemicals minister Mr. M.S. Gurupadaswamy has said the government is not under any pressure from the pharmaceuticals industry for total decontrol of drugs.

"There is no question of any pressure on the Government" he said adding, Government policies have to strike a balance between consumer and industry's interests.

The industry, had not asked for total decontrol of drugs as such. However, some sections of the industry have expressed this view. The Government, he said, was reviewing the drug policy and the aspect of production of essential drugs would be kept in mind and some incentive need to be provided for this.

Medicines directly concern human health, therefore, some price discipline would be necessary. "It cannot be total control or decontrol, but we will have to have a proper mix," he said. Mr. Gurupadaswamy said production of essential drugs required for diseases prevalent in the country was quite satisfactory. "I don't think the dru
required by the country are not bei
produced", he said.

He said it might be true that a lot
"fancy formulations which are not
important are being produced, but it h
not affected the essential drug produ
tion in a big way."

The Minister said Government d
not force anybody to produce a parti
ular item. "This can be done by polic
incentives," he said.

To a question if the gap between pr
duction of drugs for health-based nee
and actual pattern of drug production
the country would be bridged, Mr. Gu
upadaswamy said, as the drug polic
was in line with the health policy, whi
reviewing it, the objectives of the heal
policy would be kept in mind.

On whether partial decontrol of dru
introduced in 1987 had led to great
profitability and increased bulk dru
production, Mr. Gurupadaswamy sai
the growth trend of the pharmaceutic
industry had been around 10 per cent
the last ten years or so. So partial deco
trol of 1987 had not been perceptive
reflected in the increase in productio

On what prompted the Governme
to enlarge area of price control
increasing the number of drugs und
the Drug Prices Control Order, give
the liberalising strain in the Kelk
Committee recommendations, Mr. Gu
upadaswamy said, 26 drugs had bee
included under price control only on t
basis of the criteria adopted by t
Kelkar Committee.

The Kelkar Committee, he said, h
said drugs having turnover of more th
Rs. 50 lakhs per annum should be und
price control. Hence the inclusion of
drugs under price control. The proce
of inclusion or exclusion of drugs und
price control is a continous process a
depends on the essentiality and turnov
of the drug, he said.

For **IMPORT** of following Products

# (ASC) N-Acetyl Sulphanilyl Chloride (Japan)

(Important High quality intermediate for Sulpha Drugs & Vinyl Sulphone.
Also to avoid use of Chlorosulphonic Acid and pollution problem)

**Isobutyl Benzene**
**Bisphenol-A (Japan)**
**L-Lysine Feed & Pharma Grade**
**DL-Methionine Feed Grade**
**Various other Amino Acids**
**Epichlorohydrin**
**Cellosolve/Carbitol**
**Furfuryl Alcohol**
**Beta Naphthol**
**Beta Picoline**
**3-Cyanopyridine**
**Perchloroethylene**
**Ethoxylated Nonyl Phenol 9.5 Mol (Emulsifier)**
**N,N-Dimethylaniline**
**Dimethyl Formamide**
**Diethyl Sulphate**
**Cyclohexanone**
**Rangolite**
**Phenol**
**TDI/MDI**
**Naphthalene Crude**
**Iodine Crude (Japan)**
**Propylene Glycol**
**Acrylamide**
**Thiourea**
**Pyridine Pure**
**Guanyl Thiourea**
**Morpholine**
**Sorbic Acid**
**Thioglycollic Acid**
**Gamma Picoline**
**4-Cyanopyridine**
**Meta Nitro Acetophenone**
**Ortho Anisidine**
**2-Chloro Propionic Acid**
**2-Ethyl Hexanoic Acid**
**N,N-Diethylaniline**
**Para Chloro Benzoic Acid**
**Ethyl Cyano Acetate**
**Ortho Chloro Aniline**
**Aniline (Japan)**
**Polyol**

**and various other industrial chemicals/intermediates/fine chemicals pharmaceuticals etc.**

Please Contact the Indenting Agent:

PACIFIC

## M/s. PACIFIC AGENCIES

41, Prospect Chambers Annexe, 3rd Floor, 317, Dr D.N. Road, Bombay 400 001
**Telephone: Office: 2044482/244923/232833**
**Residence: Mr. Lathi 5113387 Mr. Vyas 5121909**
**Telex: 011-86799 PCFC IN**

FOR BEST QUALITY

**BENZOIC ACID**
**SODIUM BENZOATE**

PLEASE CONTACT MANUFACTURER:

**UJWAL PHARMA PRIVATE LTD.**

1421, Maker Chamber V, Nariman Point, Bombay 400 021.
**Phones: 2040232 - 2871476**
Calcutta Office: 9, Lall Bazar Street, Mercantile Building, Calcutta 700 001.
**Phones: 204286/6503 - 288737**

---

Available from local Manufacturer
(Equivalent to Import)

**DICHLONE**
**PARA CHLORO META XYLENOL (PCMX)**
**PARA CHLORO META CRESOL (PCMC)**
**2-CHLORO PROPIONIC ACID**
**ISO PROPYL CHLORO ACETATE**
**PROPIONYL CHLORIDE**
**PROPIONIC ANHYDRIDE**

Please Contact

**RICCI INDENTING & AGENCY HOUSE PVT. LTD.**

319, Panchratna, Opera House, Bombay 400 004.
**Tel. Office: 8110394/8115612** **Resi: 387251**

*EXPORT ENQUIRIES SOLICITED*

---

**ACTIVATED**
**SODIUM PENTACHLOROPHENATE (ACTIVATED SAGINOL SP.)**

**Complying to I.S.I. Specifications**

Being activated three times more effective than normal
SODIUM PENTACHLOROPHENATE
Cost reduction to consumers having excellent results as preservatives

Please write to original manufacturer

**(ESTABLISHED IN 1960)**

**SAGGITAR and DEMOR**

Kailas Road, Post Box No. 16, Bulsar 396 001.
**Telephone No.: Off.: 2456/2917 Resi.: 3422/2723**
**Bombay Phones: 4113885/4111769; 234310/2045575**

NOW READILY AVAILABLE FROM READY STOCK

**TRI ETHANOLAMINE**
**DI ETHANOLAMINE**
**MONO ETHANOLAMINE**

Manufactured by
**P.K. Velu & Co. (Pte) Ltd.**

Contact Authorised Stockist
FOR MAHARASHTRA AND SOUTH

**ATUL CHEMICALS**

*Sales Office:* 63/B, Princess Street, Devkaran Mansion, 2nd Floor,
Bombay 400 002.
Telephone: 319510/316366; Resi.: 8227125

WANTED

**H-ACID - 50 Tons**
**Ex-Stock**

Please Contact with Price and Specifications:

**M/s. SPAN INTERMEDIATES**

6th Floor, Mustafa Building,
Sir P.M. Road,
Bombay 400 001.

**M/s. GROMIT**
**(INDIA)**

Available from Ready Stock

- * Sodium Hexa Meta Phosphate
- * Ammonium Thiocyanate
- * Sodium Thiocyanate
- * Potassium Thiocyanate
- * Mercuric Thiocyanate
- * Ammonium Fluoride
- * Sodium Fluoride
- * Potassium Fluoride
- * Magnesium Fluoride
- * Calcium Fluoride
- * Ammonium Bifluoride
- * Sodium Bifluoride
- * Aluminium Silicoflorides
- * All Bromides
- * Zinc Carbonate
- * Sodium Iodide
- * Lead & Calcium Nitrate
- * Sodium Cryolite
- * Potassium Cryolite
- * Glycine
- * Ammonium Carbonate
- * Ethylene Thiourea (NA-22)
- * Acetamide
- * Tin Sulphate
- * Hippuric Acid
- * Strontium Salts
- * Copper Salts
- * Phosphate Salts
- * Nickel Salts
- * All Acetates

**Associates:**

**M/s. CHARMS CORPORATION**
**M/s. GROMIT INDUSTRIES**

229/231, Samuel Street,
R. No. 1, 3rd Floor,
Vadgadi, Bombay 400 003.

Sales Office: Tel. 336381/336382
Resi.: 6147236
Gram: "AMIBHAV"

## RUG FORMULATION PRICE

# 400 applications being cleared

The Department of Chemicals & Petrochemicals is clearing 400 pending formulations price revision applications from the pharmaceutical industry, it is learnt. Officials of the department met industry representatives in Bombay on August 7. The officials have agreed to grant 50 per cent of the new conversion norms, while making full allowance for all other input costs.

The government representatives expressed their displeasure at the advertisement campaign launched by the joint council of all associations of the pharmaceutical industry and trade. Industry representatives, however, pointed out that the advertisements were aimed at educating members of Parliament and the consumers. It was not the industry's aim to criticise the government, the officials were told.

The industry and trade had deferred their threat to launch a countrywide stir against the government policy early this month following assurances from the Minister for Petroleum and Chemicals, Mr. M.S. Gurupadaswamy. The following were the major assurances: not to increase the number of drugs in the controlled list, to implement all pending price revisions recommended by the BICP and implementation of the conversion norms. Industry sources said they were closely monitoring the turn of events. The all-India bandh had only been postponed, not called off.

## DRUG SSIs SEEK EXEMPTION FROM DPCO

The all-India Small-scale Pharmaceutical Manufacturers Association has requested the government "not to put the 12,000 small-scale manufacturers of pharmaceuticals under the drugs price control order as it would entail piles of paperwork which both the government and the units can ill afford". In a memorandum to the government it said the small-scale units abided by the ceiling on price fixed by the government.

The government should ask all purchasing agencies to place orders on generic names and not on brand names wherever the products were under pharmacopoeia. All raw materials used for the production of medicines needed under the national health programmes should be allowed for imports under Open General Licence so that there would never be a shortage of life saving medicines.

It wanted the common and simple formulations such as tablets, capsules and liquid orals to be reserved for the small-scale sector.

## BOEHRINGER-KNOLL PROJECT

Boehringer-Knoll Ltd., plans on setting up a plant at Goa to manufacture 60,000 kgs of 7 ADCA and 40,000 kg of cephalexin at a cost of Rs. 5.13 crores. The project which is expected to yield a turnover of Rs. 44 crore annually will supply a quarter of its production to Boehringer Knoll for captive consumption. Plans are to finance this project through internal accruals to the extent of Rs. 1.13 crore and loan from financial institutions to the extent of Rs. 4 crores.

## PROCESS OF SYNTHETIC SILICA, SOL & GEL

A new process developed by Mr. B.A.V.K. Sharma, Managing Director, Sharma Consultancy Services (Madras) Pvt. Ltd., to prepare synthetic silica and co-product alum from China clay has been assigned to M/s. Shinewell Granite & Chemicals Pvt. Ltd., on exclusive basis.

Processes for the manufacture of silica sol from sodium silicate using ion-exchange technology and silica gel from paddy husk using a mixture alkalies under controlled pressure temperature conditions have also be developed for the first time in the cou try.

Silica sol stabilised suitably fin extensive usage in precision casti molds, molded refractory products, an high-temperature insulating material increasing the friction of textile fibr surfaces; to provide anti-sticking, ant blocking and anti-static effect o organic films; used in biologic research, in optical effects, in photography, in silicon wafers; in paper, glas & leather; and used in modifying su factant properties.

Silica gel developed can be modifi to produce xerogel and Aerogels an used mainly as adsorbents.

## HINDUSTAN CIBA GEIGY

The board of Hindustan Ciba-Geig has recommended a bonus issue in th proportion of 1:2 subject to necessar consent, including that of RBI. In add tion it has stepped up the dividend 32 per cent, including the final of 20 p cent, for the year ended March, 199 Last time, the total dividend was 30 p cent for a longer period of 15 mont (annualised 24 per cent). The latest dividend is the record dividend from th company.

It has earned a gross profit Rs. 31.14 crores during the year again Rs. 31.40 crores in the previous 1 months on sales of Rs. 246.31 cror against Rs. 255.49 crores. This mea that the company has done well on annualised basis during the year. Aft depreciation (Rs. 5.12 crores again Rs. 7.26 crores) and taxation (Rs. 12. crores against Rs. 10.55 crores), the n profit is placed at Rs. 13.75 crores co pared to Rs. 13.59 crores in the pa period. The total dividend outgo Rs. 5.67 crores including the final Rs. 3.54 crores, compared to Rs. 5. crores in the preceding period.

# BPCL implementing MTBE project

ne Bharat Petroleum Corporation (BPCL) is working on a project will eliminate the use of lead addi- s in motor spirit to enhance octane ls, thereby putting an end to poison- lead emissions from vehicles.

he corporation is in the process of lementing a Rs. 18-crore project for manufacture of methyl tertiary butyl er (MTBE) at its Mahul Refinery mplex in Bombay, which is expected be commissioned 30 months from w.

With a capacity of 24,000 tonnes nually for MTBE, the corporation pects to cater to Bombay's require- ents to start with. This will be facil- ted by a proposed arrangement tween BPCL and Hindustan Petrol- m Corporation Ltd. to meet the lat- r's requirements of MTBE. World ver, MTBE is gradually replacing lead dditives as an environment-friendly octane level enhancer in motor spirits, according to Mr. R.K. Gajree, chairman and managing director of BPCL. With an octane level of 120, MTBE will help enhance the octane levels in motor spirits 87 and 93, as is required.

The corporation will produce MTBE from the C4 fraction of LPG, which is separated from the combined C3-C4 stream at a Rs. 25-crore plant that it has recently set up. The C3 fraction will be supplied to Maharashtra Gas Cracker Complex coming up at Nagothane in Maharashtra. For any other oil company in the country to undertake an MTBE project, it will first have to invest in the LPG cracking plant, which at today's cost could be more than Rs. 25 crores.

About six international parties are in the running for the supply of knowhow to BPCL for this project, and a contract for this is likely to be awarded in a month's time. Among the contenders are Royal Dutch Shell, Universal Oil Products, British Petroleum and some French and Italian companies. The contract will be for the supply of plant and process knowhow, including basic design, and is likely to be worth around Rs. two crores.

Mr. Gajree does not rule out the possibility of exporting MTBE at a later stage, given the demand for it in the world markets. Currently, the worldwide capacity to manufacture MTBE is barely six million tonnes annually.

## MJ PHARMACEUTICALS

MJ Pharmaceuticals Ltd., has announced a maiden dividend of 12 per cent for the year ended March 31, 1990. The company manufactures high quality injectibles like purified insulins and other formulations at Halol, Gujarat. The company achieved a turnover of Rs. 32.73 crores during the year 1989-90.

FOR YOUR IMPORT REQUIREMENTS OF:

**BUTYLAMINE (Mono-Di)**
**N-PROPYLAMINE (Mono-Di)**
**ETHYLAMINE (Mono-Di-Tri)**
**ALLYLAMINE (Di-Tri)**
**CYCLOHEXYLAMINE (Mono-Di)**
**MONO-ISOPROPYLAMINE**
**DI-ISOBUTYLAMINE**
**DI-METHYL BUTYLAMINE**
**DI-TERT-BUTYLENEDIAMINE**
**N,N-ETHYLMETHALLYLAMINE**

Please Contact:
AGENTS IN INDIA

se soofi enterprises

1317, Dalamal Tower, 211, Nariman Point, Bombay 400 021
Tel.: 224689/233074 Telex: 0118-4187 SUFI IN Cable: SOOFICHEM Fax: 2047657

# New distributors for Du Pont appointed

Du Pont in India have announced the appointment of M/s. Bhimrajka Impex Private Ltd. as their new distributor for the complete range of Du Pont Industrial Polymer products. M/s. Bhimrajka have been servicing the needs of the industrial polymers and rubber industry over the last 15 years with the help of their commercial and technically trained staff.

Du Pont offers a wide range of advanced polymers for industrial application and specialty wire and cable products. **Hypalon**-chlorosulphonated polyethylene rubber is used for high quality mining, ship wiring and locomotive cables. It is also formulated to produce high quality offshore cables, and low fire hazard cable jackets. Industrial applications are roofing, pond lining, canal lining, automotive applications and industrial moulding.

**Nordel**-EPDM rubber is unique in electrical and high heat ageing properties and is used in high voltage cable insulations. Other applications are roofing, weather strip hoses, engine mounts, gaskets, automotive products and industrial tyres and side walls. Neoprene is a classic product that is formulated for wire and cable application, adhesives, sealants, bridge bearing pads, v-belts, hoses etc.

**Viton**-fluoroelastometer is used almost in all military, defence and aerospace applications. It is also used in offshore drilling, automotive, industrial application where heat and chemical resistance are of utmost importance. **Viton** can withstand a service temperature of 250 C plus. **Viton** is unique in its application as 'O' rings, gaskets, seals, fuel hoses and flute duct expansion joints.

**Vamac**-ethylene methyl acrylate elastomer is intended for applicati where fire safety, corrosion resistanc anti-damping, oil and heat resistanc are the major end-use properties. It widely used in zero halogen cables a automotive parts.

**Hytrel** is a thermoplastic elastom that combines the properties of plasti and rubber. It is tough, abrasion and te resistant, low cut through good oil resi tance and flame retardant.

It can be processed on convention thermoplastic extruders and processe easily without additional compoundin Major applications: tinsel cords, of shore drilling cable jackets, heavy du cables, flexible cords and engineerin parts and hoses.

EDTA
EDTA
EDTA
EDTA
EDTA
AND IT'S SALTS
MFRS.
SONY CHEMICALS
1/2 DARSHAN UDYOG BHAVAN, SAFED PUL,
M.V. ROAD, BOMBAY - 400 072
PHONES: 5120926/5120713/5136822
GRAM: NEWGENER TELEX: 011-72398 SOC IN

## GUJARAT'S CASE FOR HIKE I CRUDE OIL ROYALTY CONSI ERED

The Centre will soon set up a con mittee to look into Gujarat's demand fo higher royalty on crude oil extracted the state, the state Chief Minister M Chimanbhai Patel said on August 1 Mr. Patel said that this assurance ha been given to him by Prime Ministe Mr. V.P. Singh following a meetin with him to discuss the issue.

Gujarat is paid a royalty of Rs. 37 on every tonne of crude extracted fro the state. This rate became applicab after a rise of Rs. 182 a tonne given b the Centre recently to the state gover ment over the previous rate of Rs. 19

However, the state government fe that even this increased amount wa inadequate, Mr. Patel said. The Gujar government is also pressing the Cent to give it a higher price for the natur gas taken from the state.

For this, a representative body leaders from all political parties in th state would be formed to represe Gujarat's case to the Centre, Mr. Pat said.

# Bharat Salt goes on stream

ne largest salt refinery of the coun- with a capacity to produce about ,000 tonnes every year has gone on am. The refinery set up by Bharat Refineries Ltd. would produce salt 99.6 per cent purity, conforming nternational standards.

ccording to the company's presi- t, Mr. P.B. Anadam, the brand name he product is 'Bharat Salt' which uld be sold in one Kg. pack costing out Rs.. 2.25. The Tata's salt has a ity of 90 per cent which is accept- e by ISI. However, 'Bharat Salt' is ceptable to the industrial users as well sides being edible. According to the mpany's president since 'Bharat' atches the international standards, it s tremendous export potential. Neg- iations with Japan are on the final ages to export about three lakh tonnes very year.

'Bharat Salt' refineries are being set p by Well Brines Chemicals at Bachau Gujarat, which is the largest and most odern in the country. The refinery pread over 14 acres has been built at cost of Rs. 25 millions with the finan- ial assistance of Gujarat State Finance Corporation. The company has planned o build five more refineries in the coun- ry with same capacity, in the next 24 months, and the total capacity of these efineries would be seven lakh tonnes per year. In order to maintain the highest standards, Mr. Anadam said, plans have been drawn up to develop the company's own salt fields simultaneously with an investment of around Rs. 10 crores.

## UN AWARD FOR CECRI SCIENTISTS

The National Research Development Corporation (NRDC) Prize Award Committee has announced the 1990 gold and silver medal awards sponsored by the World Intellectual Property Operation, a specialised organisation of the United Nations. The gold medal goes to a team of scientists from the Central Electro Chemical Research Institute (CECRI) in Karaikudi for developing an improved modular cell for production of magnesium metal from sea bitterns and magnesite. The CECRI scientists are: P.S. Desikan, K.S. Srinivasan, A. Selvakesavan, G.N. Kannan, S.M. Sukumaran, L.K. Srinivasan, P. Subramanian, C.O. Augustin, T. Selvin Devasahayam, N. Rajagopalan, K.S. Dandapani and S. Srikantan.

The silver award goes to Mr. M.R. Mohijit Sen of Calcutta for developing a tea processing machine for cutting, tearing and curing tea leaves.

NRDC has also announced its 1990 Independence Day awards for four meritorious inventions. Four scientists from the National Physical Laboratory (NPL), New Delhi, have been jointly awarded Rs. 50,000 for developing an innovative process for the manufactue of monochrome TV picture tube phosphor using indigenously available commercial grade raw material. Scientists from the Central Electronics Engineering Research Institute (CEERI) in Pilani and a private company in Bangalore jointly share another Rs. 50,000 for the development of knowhow for the fabrication of thick film hybrid microcircuits by screen printing of conductive, dielectric and resistive pastes of alumina substrates.

A team from the Bharat Heavy Electricals Limited (BHEL) in Hyderabad gets Rs. 25,000 for developing a microprocessor-based controller for electrostatic precipitators for pollution control in thermal plants.

The fourth award for meritorious inventions goes to scientists from the Central Power Research Institute (CPRI) in Bangalore who get Rs. 15,000 for developing a corrosion-resistant coating for conductors.

FOR YOUR REGULAR REQUIREMENTS OF

WHITE BEESWAX
YELLOW BEESWAX &
HONEY

PLEASE CONTACT MANUFACTURER :

MEHSONS CHEMICALS PVT. LTD.,

P.O.B. No. 121
KAMLA BHAWAN, MADARI GATE,
BAREILLY 243 001 (U. P.)
PHONES : 76517, 77359, 74150, 76526
TELEX 0577 209 MF IN
CABLE VEGLAMUKHI - BAREILLY

# Rama Petro to make 2-EH

Rama Petrochemicals (belonging to the Rama group of companies), now a single product company running a 50,000 tonne methanol plant in Patalganga, is diversifying. The company recently received a letter of intent to set up a Rs. 40-crore plant in a backward area of Uttar Pradesh to manufacture 2-ethyl hexanol, a chemical which goes into plasticizers used in PVC processing.

There is only one manufacturer of 2-ethyl hexanol at present: National Organic Chemical Industries Ltd. (NOCIL), whose production is not sufficient to meet the requirements of the industry, not to speak of the growing demand following several large PVC plants that are being seet up.

Unlike NOCIL and Andhra Petrochemicals (the latter is also setting up a 2 EH plant in the south), who use propylene as feedstock, the Rama project will use alcohol. Compared to propylene, which is in short supply, alcohol route is said to be cheaper. This is because alcohol need not be converted into ethylene, as is the case in the manufacture of MEG and other glycols.

Rama has already tied up Brazilian technology and is in the process of finalising the means of raising money for the project.

---

## WORKSHOP ON "MODERN TECHNIQUES IN FORENSIC TOXICOLOGY"

A 5-day workshop on "Modern techniques in forensic toxicology" is being organised by Forensic Science Laboratory in collaboration with Indian Academy of Forensic Sciences (Ahmedabad Chapter) and Indian Institute of Chemical Engineers, Ahmedabad Centre from 20th September to 25th September, '90.

The objective of the workshop is impart theoretical and practical traini in the following fields: (1) **Foren toxicology** a. accidental poisoning criminal poisoning and c. suicides ( **Industrial toxicology** a. industrial tox chemicals b. pesticides and c. food adc tives (3) **Narcotics and drug abuse** narcotic & psychotropic substances a b. drugs of abuse.

Following instrumentation techniqu shall be covered:

1. GLC-head space for volatile poiso and toxic chemicals
2. GLC-FID, NPD, ECD and FP dete tor with capillary column for drug narcotics and pesticides and ind strial toxic chemicals, food additiv
3. H.P.L.C. with U.V. photodiodar (rapid scan), fluorescence and ele trochemical detectors for drugs, na cotics, organo phosphoro pesticides, food additives and ind strial chemicals
4. GC-Mass spectrometer for dru narcotics & pesticides
5. U.V. and fluorescence spectrosco for drugs
6. Radio immuno assay for opium, ca nabis, benzodiazepines etc.

In order that maximum exposure c be given to the participants to handle t instruments, only limited seats are ava able.

For further details contact: Indi Institute of Chemical Enginee Ahmedabad Regional Centre, Chen cal Engineering Deptt., L.D. College Engineering, Ahmedabad 380 015. Te 443618.

---

## INDIA GLYCOLS

India Glycols has earned a gr profit of Rs. 287.66 lakhs during its f period of commercial production wh ended March 1990. on a turnover Rs. 737.56 lakhs. After depreciation Rs. 269.66 lakhs and taxation Rs. 2.02 lakhs, there is a net profit Rs. 15.08 lakhs. There is no divide

An Industrial House Requires a
CONSULTANT
to prepare a feasibility report on
a chemical complex to manufacture
ACETIC ACID
MCA
CMC
EDTA
2-ETHYL HEXANOL
from ETHYL ALCOHOL
Contact:
BOX NO. 188
CHEMICAL WEEKLY
Room No. 9, Wellingdon Estate, 3rd Floor,
24, Commander-in-Chief Road,
Madras 600 105.

# RCF bags excellence award

ashtriya Chemicals and Fertilisers
F) has bagged the overall excel-
e award institute by the Ministry of
gramme Implementation for
7-88. It has simultaneously received
Prime Minister's MoU award for
ellence in 1989-90.

he acting Chairman and Managing
ctor of RCF, Mr. R. Chandrasek-
n received both the awards at a func-
n organised in Delhi on Aug 11.

According to a release issued by
F, the company set a new produc-
n record at 23.13 lakh tonnes during
87-88. Sales climbed to an all-time
gh at Rs. 905.53 crores and profit
ached Rs. 220.71 crores.

RCF also revamped the 22-year old
phala plant at Trombay at a cost of
s. 15 crores during 1987-88. This
habilitation restored the rated capac-
y, improved the nutrient efficiency by
tal recycling of effluents and reduced
e pollution level.

The rehabilitation project to moder-
ise the Trombay ammonia plant
unched in 1987-88 has also been suc-
essfully commissioned by changing
ver the process from partial oxidation
o steam reforming at the cost of Rs. 65
rores. The rehabilitation it is claimed,
vill save energy consumption to the
une of Rs. 31 per cent.

---

## MALLYA HOPES TO CLINCH MCF 'IN A WEEK OR TWO'

The take-over of Karnataka's ailing joint sector company, Mangalore Chemicals and Fertilisers (MCF), by the UB group is expected to be finalised within a week or two, according to Mr. Vijay Mallya, UB Group chairman.

Addressing a news conference at Bangalore on Aug 10, he said all terms and conditions for the handling over of MCF to UB group had been virtually agreed to between the State Government, financial institutions and the UB group. "We are waiting for the finalisation of the tripartite agreement, and hope to execute it soon," he said, adding "the quicker this is done, the better."

Though MCF is basically a good plant with a tremendous potential, Mr. Mallya said it was a "rudderless ship at the moment."

Mr. Mallya explained that his group wanted to take over MCF for a number of reasons, including sentimental ones as the company was located in his home town of Mangalore and as a tribute to his late father, Mr. Vittal Mallya. "We also wanted to increase our asset base in the state. We were keen on getting into fertilisers. The proposed Mangalore refinery, petro-chemical complex and various other projects on the anvil are contributory factors," he mentioned.

The UB group chief expressed full confidence about rehabilitating MCF and turning it round. We have worked out an attractive rehabilitation package deal with the financial institutions which enables us to pay back the company's debts.

Mr. Mallya said the UB group was planning to revamp and expand the MCF plant by pumping Rs. 10 crores immediately after taking it over. Another Rs. 10 crores are likely to be raised in the next three months through a rights issue. Without the rehabilitation package, MCF would have been a millstone round the neck of other industrialists, he said. "We are confident of repeating our feat of rehabilitating the sick Best and Crompton unit in the case of MCF," he declared. He however, refused to work out a time frame for rehabilitation of MCF. The company's total liabilities are around Rs. 200 crores, a large part of which are secured against its assets.

AVAILABLE

Ready Stock
**Methylene Chloride**
99% Purity
in 250 Kg. Net wt. (Drum)

Contact for your regular requirements
**GLOBLE AGENCIES**
Pooran Asha Building,
31/, Narsi Natha Street, Bombay-400 009.
Phone: 335061 (10 LINES) Gram: INCHEMOX
Telex: 11-76723 CHMX IN Fax: 91-22-855 89 38

# Dual pricing for fertilisers mooted

The Union government is close to finalising a strategy to reduce food and fertiliser subsidies by over Rs. 4,000 crores. The reduction is planned to be effected in a phased manner over two years.

At present, the annual burden on the exchequer on account of food and fertiliser subsidies is an estimated Rs. 6,200 crores. Food accounts for Rs. 2,200 crores, while Rs. 4,000 crores is the burden on fertilisers.

The government thinking at the highest level is that any proposal for substantial reduction in subsidies, particularly on food and fertilisers, has to be implemented in phases. This is because a major subsidy cut of Rs. 4,000 crores in one stroke is bound to create political problems for the National Front government.

Senior officials in the government say that the proposed strategy will seek to reduce the present coverage of fertiliser subsidy and, simultaneously, bring down the gap between the procurement and issue prices of foodgrains over a two-year period. Inter-ministerial discussions on the strategy have already taken place.

These officials are hopeful that the strategy will get the nod even at the ministerial level. This is because in the recently held cabinet meetings, all ministers have expessed concern over the rising subsidy bill. They have also underlined the need for evolving a mechanism by which the burden is reduced but, at the same time, the needy beneficiaries are not affected.

The strategy envisages that in the next two years fertiliser subsidies would be provided only to poor farmers who do not have marketable surpluses, and to farmers in the north-eastern states, where the use of fertiliser needs to be increased. In this manner, the annual fertiliser subsidy will come down from the Rs. 4,000 crores to Rs. 1,500 crores. The official argument is that the farmers who have marketable surpluses should not be provided any subsidy. This is because in the new formula for determining prices for foodgrains, the actual cost of all inputs would be reflected. This will take care of those farmers who sell their produce in the market.

The food subsidy is also expected to decline by at least Rs. 1,500 crores, once the principle of gradual reduction in the difference between the procurement and issue prices of foodgrains is implemented. Already, the paddy procurement prices have been raised and along with that the issue prices have also been hiked.

It is also proposed to hike the wheat procurement price for the coming season, which would be followed by a corresponding increase in the issue price of wheat.

The government's other major subsidy is for export promotion, which is estimated at Rs. 2,316 crores for 1990-91. If, however, the food and fertiliser subsidy burden is reduced by Rs. 4,000 crores, much of the government's problem on the subsidy front would be taken care of, say senior government officials.

---

## FAI OPPOSES CHANGES IN PRICING NORMS

---

The fertiliser industry has taken up cudgels against the dual pricing proposal which had recently been mooted in government circles to cut down subsidy.

According to Mr. Pratap Narayan, executive director of the Fertiliser Association of India (FAI), a representative body of the industry, statistics reveal that the benefit of fertiliser subsidy actually accrues to the small farmers as the average application rate per hectare by larger farmers is lower than that of the smaller ones. Further, available d shows that the number of small far using fertilisers far exceeds number of large farmers.

Mr. Narayan argued that if a du pricing system is introduced, the ra between the minimum and maxim price may have to be one to two or ev higher, considering weather uncerta ities. This ratio may induce the farm to sell fertilisers purchased at subsidis price to a large farmer at a premiu thereby defeating the objective of t system.

If farmers who are entitled to sub dised fertilisers are defined as tho without disposable surpluses, then pr vision of the material at full cost to tho small farmers with some marketa surplus will adversely affect their via ility and their fertiliser use patterns

He said that this was the reason w differential pricing had to be abandon in Sri Lanka and the Phillipines. F large farmers, fertiliser use is a busine proposition and if the free market pri is increased without hiking the produ procurement price, fertiliser use m suffer adversely. On the other hand, the procurement price and the iss price of the product is jacked up, l income consumers stand to suffer. addition to the scope for leakages a malpractices, the infrastructure requi to administer a dual pricing system rural areas would entail a prohibit price.

Mr. Narayan stated that unl cement, fertiliser is a rural-based c sumption commodity, dual prici system in a rural, semi-literate envir ment does not seem to be feasible practicable.

The FAI executive director quo from the National Council for Appl Economic Research (NCAER) surv (demand study, 1980 to show that sm and marginal farmers (upto two h tares), with about 25.4 per cent of area cultivated, account for 31 per of total fertiliser consumed while farmers (10 hectares and above) titute only 11.2 per cent of fertiliser with a land area of 18.7 per cent. small and marginal farmers also lise much higher proportion of their s cropped area at 70 per cent and per cent respectively as against a e 50 per cent by large farmers.

ven more significant is the fact that level of fertiliser use per hectare at kg. for marginal farmers and 86 kg. small farmers is substantially higher n the large farmers' consumption el of 59 kg. These conclusions, how-r, were based on data available in the d-70s.

But considering the further fragmen-ion of land holdings during the last cade or so, as reflected in the increase the number as well as area under nall and marginal farm households tegory, the conclusions drawn earlier ll hold true even today, Mr. Narayan ated.

Then again, it is argued that compli-tions may arise in determining the pper limit of fertiliser price. If the price merely an average of the cost of pro-ction of the industry, new units, with gh capital cost and interest and depre-ation provisions may be priced out. resh investments will suffer as a result. Ir. Narayan stated that while fertiliser ubsidy is ballooning and there is per-aps a case for curtailing it, it should e done in a systematic manner by exa-nining all avenues for reduction. For xample, curbs could be placed on input rice increased for the fertiliser indus-ry. Steps should be taken to ensure that he wrong signals are not sent to the ndustry, so that fresh investments in this area does not suffer. The relationship betwen fertiliser production, its use and its impact on food grain production are well known.

The food and fertiliser subsidy in the untry eats up a whopping Rs. 6200 crores per annum. A phased reduction of the subsidy is, therefore, contemplated by the Union government by increasing the issue price of food grains and by introducing dual pricing for fertilisers.

## RABI SEASON: WB TO DEMAND MORE FERTILISERS

West Bengal government is likely to demand for a higher allocation of fertilisers for the coming rabi season (October-March 1990-91) at the fertiliser allocation meeting to be held in New Delhi. The agriculture ministry has called the meeting of eastern and north-eastern states on August 23 and 24 decide on allocation, at least tentatively.

For West Bengal, the meeting is important, particularly in the light of its previous experience. At the last year's allocation meeting at Patna, the state was allocated less of nitrogenous fertilisers, 225,000 tonnes for rabi season of 1989-90 against the actual consumption of 241,000 tonnes in the rabi season of 1988-89. Subsequently, however, the demand was met in full through additional allocations.

According to informed sources, the state government has placed the season requirements at about 480,000 tonnes (in terms of nutrients), representing 13 per cent increase over the actual consumption of 424,000 tonnes in the last rabi season (October-March 1989-90). The actual fertiliser consumption in the state in the last rabi season was barely two per cent more than the actual consumption of 416,000 tonnes in the rabi season in the previous year (October-March 1988-89).

The state government does not forsee a major problem is getting sanctioned whatever is demanded. The reasons for the optimism is not hard to find. The change of political scenario is one. The Centre State equation is much better now than before. Also, in the absence of a full-fledged agriculture minister at the Centre, the officials in charge of the ministry are unlikely to opt for a decision which might not kick up a row.

A fair good rainfall all over the state in the current monsoon is expected to bolster the demand for fertilisers for the winter paddy. A favourable residual most condition in the soil as a result of the rainfall too is likely to push up the fertiliser demand for other rabi crops like wheat, pulses, groundnut and others.

The state government is hoping for a jump in fertiliser consumption in the coming rabi season even though the good monsoon did not really help in boosting the consumption in the current kharif season. According to informed sources, the total fertiliser consumption in the state in the current kharif is likely to be of the order of 274,000 tonnes against the allocation of 279,000 tonnes. The drop in consumption, though marginal will be recorded in respect of both nitrogenous fertilisers and phosphate. Potash, on the other hand, was hit by limited supply.

Item-wise break-up shows that the state will require in the forthcoming rabi season about 270,000 tonnes of nitrogenous fertilisers (N), 130,000 tonnes of phosphate (P) and 80,000 tonnes of potash (K). When compared to the actual consumption in the last rabi season, these estimates show a 12 per cent increase in respect of N, 17 per cent for P and 11 per cent for K.

However, the actual consumption of N in the last rabi (1989-90) at 241,000 tonnes was the same as in the previous rabi season (1988-89). During the same period, the actual consumption of P and K registered improvements of four and six per cent respectively. Hindustan Fertiliser Corporation will, as before, be accorded the lead distributor status in the state. HFC's Durgapur plant has not been doing too well. Of late, the production of the unit has been affected by power crisis.

### OINT SECTOR KARNAL REFINERY

# Soviet turnkey offer rejected

The committee of secretaries had decided against turnkey execution of the six million tonnes, joint-sector, Karnal refinery. This, in effect, means rejection of the Soviet turnkey offer.

The Soviet Union had offered to put up the refinery at an incredibly high cost of Rs. 2,600 crores as against Rs. 1,400 crores estimated in the detailed project report.

The committee of secretaries, however, is in favour of accepting the original Soviet offer of technical assistance worth Rs. 600 crores for the purchase of equipment.

The joint-venture will now have the option to buy equipment of its choice from various markets, including the Soviet Union. In spite of the decision of the committee, the future of the Karnal refinery is still under a big question mark. The promoters and the government appear to doubt each other's sincerity. Mr. Darabari S. Seth, the boss of Tata Chemicals, now suspects that the Karnal refinery was conceived as an election stunt.

The committee does not believe that the Tatas, the co-promoter, will pull out of the project in view of its decision rejecting the turnkey concept. However, if they decide to do so, the Indian Oil Corporation (IOC) will be free to take up the project on its own. The entire issue is likely to go to the Union cabinet for a decision.

Mr. Seth said that the Tatas were not “wedded” to the turnkey concept. In fact, the concept was alien to them. However, they wanted to Soviets to be given a chance to modify their turnkey offer, as it suffered from many “majc
and serious” errors. According to M
Seth, the turnkey offer was invited b
the IOC in view of its “dismal exper
ience” at the Mathura refinery.

Refinery circles in Delhi have bee
blaming the Tatas for supporting th
Soviet offer. The IOC believes that th
entire project can be completed at a tota
cost of Rs. 1,600 crores. It has bee
pleading with the government to take
speedy decision and even offered to pu
up the project with its own resource

Mr. Seth made it clear that his con
pany was willing to co-promote the pro
ject on the basis of Soviet technica
assistance. He alleged that the Karna
refinery was never seriously pursued
“It seemed to pop up on the eve of elec
tions and go dormant again,” he sai
commenting on the delay in implemen
ing the project. While the governme
and the IOC would not like to go c
record blaming the Tatas for the dela
they have been giving the impression c
being frustrated with them. Some
them have been doubting the capaci
of Tata Chemicals to take up all t
three projects together.

In addition to the Karnal refiner
Tata Chemicals have got the Rs. 65
crore fertiliser project in U.P. and t
petrochemicals project in Haldia. M
Seth reacted sharply to this by descri
ing it as a “canard”. “We do n
commit ourselves to any projects ligh
heartedly. We have all the resources a
are fully equipped to do all these thr
projects as they have been planned,”
claimed.

Mr. Seth maintained that the fate
the Karnal refinery depended on the g
vernment's decision on the creation
new refining capacities based on impo
ed crude. According to him, there ha
been “genuine and understandabl
differences of opinion within the go
ernment and the Planning Commissi
over the question of creating new ref
ing capacities based on imported cru

Unitop
SURFACTANTS

NONIONICS
ETHYLENE OXIDE CONDENSATES
OF
NONYL PHENOL, OCTYL PHENOL,
FATTY ACIDS, ALCHOHOLS, AMINES
USED AS
WETTING AGENTS, EMULSIFIERS, LEVELING AGENTS
SOLUBILISERS, CLEANING AIDS

WE ALSO OFFER

SPIN FINISHES
DETERGENTS
CORROSION INHIBITORS
DEMULSIFIERS
DEFOAMERS
DISPERSING AGENTS

ANTICAKING AGENTS
DEGREASING AGENTS
LEVELING AGENTS
CONING OILS
ANTISTATIC AGENTS
AGRO EMULSIFIERS

CONTACT MANUFACTURERS
UNITOP
CHEMICALS PRIVATE LIMITED
Factory: A-18, M.I.D.C PATALGANGA, RAIGAD DIST. TEL: 317
Sales Office: 34-35, ISLAM BUILDING, 46, VEER NARIMAN ROAD
OPP AKBARALLYS, BOMBAY-400 023
TEL: 204 8406, 204 6906, 512 5077, 512 5409, TELEX: 011-3654 TPPL
SHARE OUR EXPERIENCE & KNOWLEDGE OF SURFACTANTS

# el Authority to raise Rs. 4,600 crores on its own

e Steel Authority of India Limited n has been financing capital tments without budgetary support the Government since 1986-87, is ing to raise internal resources of t Rs. 4,600 crores during the th Plan period.

fficial sources pointed out that over next six years, SAIL plans to eve a 40 per cent increase in the luction of crude steel to 12 million es from the current levels. SAIL has n making all efforts to increase acity utilisation during the same od to 95 per cent from the current els of 77 per cent. During the Sev- h Plan period, SAIL improved its formance with an average growth e of six per cent in crude steel pro- ction and generated internal resour- s of Rs. 2,700 crore.

Sources said, despite improving ends, SAIL still has to improve pro- ctivity and efficiency to match those international steel producers. This ould depend upon availability, consis- ncy and price of key raw materials, odernisation, maintenance and tech- ological upgradation and improvement the skill level of the workforce. In iew of the shortfalls in coking coal upplies from indigenous sources, both uantitatively and qualitatively, SAIL tarted using imported coal since it was nore cost effective than importing steel. This has resulted in a net saving of for- eign exchange, the sources said.

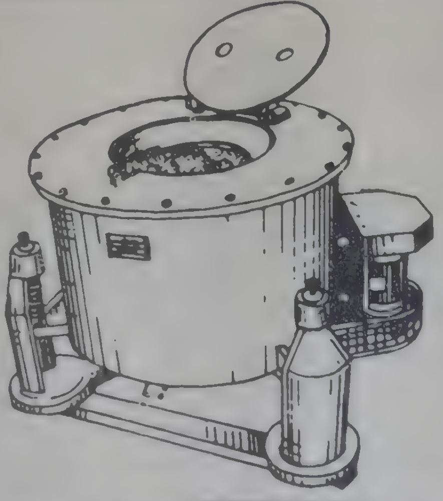
SAIL has already entered the inter- national market by exporting Rs. 115 crore worth of mild and special steels. During the current financial year it plans to export steel worth Rs. 200 crore. After the modernisation of its Durga- pur, Burnpur and Rourkela plants, SAIL would be able to reduce production cost to 15 per cent below international levels. The sources said that if 35 million now being exported, was converted to pig iron or steel, the net additional foreign exchange earnings through export of steel would be eight times higher. Similarly, it may be possible to import semi-finished steel to be rolled in India thereby increasing the finished steel exports.

To bring down costs and increase productivity, SAIL has proposed to invest 30 per cent of modernisation funds on improving facilities for preparation, benefication and blending of raw materials. Another 30 per cent will be spent on replacing age old methods of steel production by continuous castings.

## CAST IRON SCRAP ON OGL SOUGHT

In the wake of the continuing shortage of pig iron, the foundry industry has made a strong case for allowing import of cast iron scrap under OGL with the duty structure same as that for pig iron. This will be cheaper than pig iron import and will, in turn, help the foundries realise the production and export targets by being more competitive, according to spokesman of the industry.

Addressing newsmen at Madras, Mr. S. Santhanam, Vice-president, Indian Institute of Foundrymen, said another alternative to overcome the shortage of pig iron is to allow cast iron foundries to import steel scrap at preferential rate of duty as enjoyed by some other industrial sector. Since many of the foundries have electric arc furnaces (EAFs), steel scrap could be used for castings with better properties, he said. He said as against a demand of 1.3 million tonnes of pig iron in the country, the Steel Authority of India (SAIL) has a committed supply of only eight lakh tonnes, leaving the gap to be bridged by imports.



Tele :-(Fact)
87 11 80
87 12 80

Tele :-(Resi)
78 392
78 330

CHEMTEX
ENGINEERING ENTERPRISES
Mfrs. Of : ● DRYERS ● CENTRIFUGES
● BABY BOILERS ● REACTION VESSELS
Plot No : 277 - 278 Opp. L-1 Shed
G. I. D. C. Ind. Estate, ODHAV - 382 415 (AHMEDABAD)

### 34TH AGM OF CAMA

# Antop Hill Warehousing on: all hurdles cleared

The controversial Antop Hill Warehousing Company's project is finally cleared of all hurdles as the courts have removed all legal obstacles which had blocked the chemical storage project. Construction work has begun. One major change is that the warehousing can now store non-hazardous chemicals and goods only. The Supreme Court has discharged the companyfrom all writ petitions. This followed filing of an affidavit by Govt. of Maharashtra in which is accepted the Garg Committee report, and directed the company to construct the godown strictly in accordance with the recommendations of the committee.

The Bombay High Court has also discharged the company from a writ petition filed by the 'Save Bombay Committee'' in its ruling of March 30. As per the recommendations of the Garg panel, godowns will be built for the construction of non-hazardous chemicals only. The company had spent almost Rs. 4.30 crores on the project when work stopped in 1986. Some traders who had booked godowns for hazardous chemicals have since converted their applications for storing non-hazardous chemicals and others have cancelled their applications.

This was announced by **Mr. J.N. Guzder**, Chairman of the Antop Hill Warehousing Co. Ltd., (AHWP) at the 34th Annual General Meeting of the Chemicals & Alkali Merchants' Association (CAMA) at Bombay on 31st July. **Mr. P.B. Sharma,** Additional Commissioner of Bombay Municipal Corporation was the Chief Guest. Earlier **Mr. S.K. Joshi,** the outgoing President of CAMA, welcomed the guests and others. The incoming President **Mr. R. Natarajan** of Associated Agencies (Bombay) also spoke on the occasion.

## Storage problem still unresolved

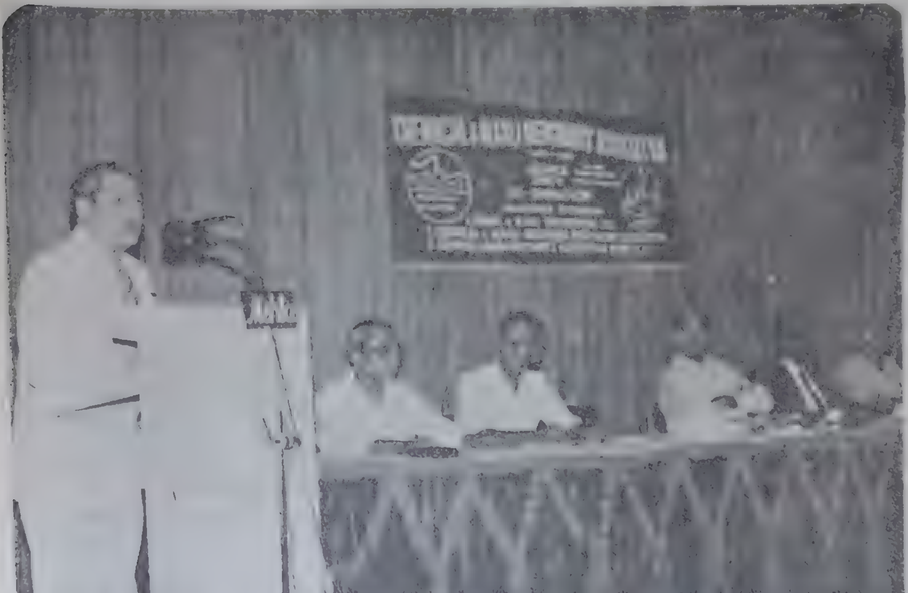
Welcoming the chief guest and others, Mr. Joshi noted that the storage of chemicals, be it hazardous or non-hazardous was a "burning problem for all of us''. He noted that the Antop Hill Warehousing Co. had already spent
Rs. 4.30 crores on the project
members having contributed Rs.
crores so far.

"In February 1990 the Supre
Court discharged the company
writ petitions before it. This was only
ter filing of affidavit by Govt. of Ma
rashtra in effect accepting the G
Committee Report and instructing
company to construct the godowns st
tly in accordance with the recomm
dation of Garg Committee. The H
Court of Bombay also discharged
company from a petition filed by "Sa
Bombay Committee'' in March 19
We now expect the work on the proj
to commence soon'', Mr. Joshi sai

However, he added "the basic pro
lem of storage of hazardous chemic
remains completely unresolved and
will have to continue to store the
chemicals in the present godowns wh
ever they are located with deep regr
Instead of providing a practical soluti
the Garg Committee with one stroke
pen has changed the complete comple
ion. To be more precise instead of su
gesting remedies or corrections, if at
any was needed, it torpedoed the who
concept and the scheme'', Mr. Jos
lamented.

"After having to cope with so ma
controls and restrictions from vario
authorities we have had also to field t
various outcries from vested interes
who have been from time to time mi
informing and misguiding the gene
public on the issue of the Antop H
Project and the subject of chemical sto
age in general. The traders are no le
aware of their social responsibilities a
are not naive to play with the enviro
ment. If the State Government and t
Bombay Municipal Commissioner c
have constructive dialogue with t
traders in these issues and impleme
them swiftly Bombay will be a mu
better place for all of us to live in'', M
Joshi noted.

Commenting on the appalling co
ditions in which the chemical trade



Mr. J.N. Guzder, AHWC chairman, addressing the gathering. Others in the picture from L to R: Mr. A.K. Doshi, Hon. Secretary; Mr. S.K. Joshi, the outgoing President, Mr. B.B. Sharma, Addl. Municipal Commissioner; and Mr. R. Natarajan, the incoming President.

ut their business at Vadgadi, Mr. said, "road conditions are unable, making already bad traffic ons worse. Sanitation and upkeep t by human standards. On top of ety and security is at a premium. quest the concerned authorities to ly these situations and do justice tax payers money."

. Joshi informed the gathering that ciation was now registered as a c charitable trust. Consequent upon n application had been made to the ne Tax Authorities for registering Association under section 12 (A) he Association is now registered r section 12 (A) of the Income Tax "These registrations will be of t advantage to the Association for lucting various activities of the ociation smoothly", Mr. Joshi felt.

Ir. Joshi surveyed the current ecoic situation. He lamented that the lget had not provided any relief to traders. Talking of the Sales Tax, Joshi complained that the definition Resale' was confusing and created a of problems. Regarding the octroi, Joshi wanted the Municipal Comssion to call a joint meeting of the pt., traders and others to find out ys and means to reduce many hures.

Tracing the history of Antop Hill arehousing project right from its ception to the current status, Mr. J.N. uzder, Chairman of AHWP said:

"Sometime in 1975-76, there was a rrible fire accident in Vadgadi area C-Ward) where the chemical merhants have their godowns and shops. Iany people lost their life and huge mount of property was lost. Arising out f this fire, the Government of Mahaashtra took a firm decision to shift the odowns storing hazardous chemicals rom wards B & C (Vadgadi and surounding areas). Notices were duly erved on the shop keepers to shift their godowns. Then the Government called Mr. Kilachand and enlisted his cooperation in resolving this problem. Mr. Kilachand requested the Government to give an alternate accomodation for the godowns. The Government then allocated 19 acres of land through Bombay Municipal Corporation who will in turn allotted the same to an organisation which would distribute godowns to its members to store hazardous, non-hazardous and extra-hazardous chemicals. Thus the Antop Hill Warehousing Company was formed. The President of Indian Merchants Chamber was the Chairman of the new company. In 1980-81, I became the Chairman of AHWC. We then came to know that the allotted land was part of a development plan through which a road was to be constructed. We moved BMDRA authorities to change the plan and divert the road. Some encroachments were also cleared. Since the proposed godown was to store hazardous and extra-hazardous goods, we had to get the clearance from the Central Government who after examining the case thoroughly granted the licence. Everything went off well. Finally the work commenced in 1983-84. Because the project was to come up in a swampy land, lot of deep piling work had to be undertaken. By 1986 we were able to complete the piling.

"In October 1986, we had a board meeting at the Indian Merchants Chamber office when a representative from a financial journal wanted to take a photo of the board meeting in session. He was given permission to take photos, not realising ofcourse, these photos would create enormous problems. A scathing article about the AHWP appeared in the publication. Most of the information in the article was false. It said the AHWP would store some 50,000 tonnes of highly explosive materials. The article said that the project would be another Bhopal and likely to destroy entire city. Many national dailies published excerpts of this article and a lot of furore was created. Then Mr. Subramanian, the then Housing Development Minister of Maharashtra, called me up and asked me to stop the construction work temporarily. Then the Government appointed Dr. Garg Committee to go into the entire aspects of the project. After considerable deliberations the Garg Committee recommended that the project would store only non-hazardous chemicals and goods. The Government of Maharashtra accepted the Committee's recommendations and asked us to go ahead with the project and ensure that only non-hazardous chemicals and goods could be stored. An allotment committee has been formed with two representatives from the Government and Municipal Corporation. The project will be completed very soon as soon as the required amount is received from the members", Mr. Guzder concluded.

**Mr. V.B. Sharma,** the additional commissioner of Bombay Municipal Corporation, in his short speech assured the gathering that BMC would ensure all safety measures in the B & C wards. He said that apart from storing hazardous chemicals, care should also be taken in handling and transporting them. Mr. Sharma also talked of the octroi problems. Despite strict supervision, considerable evasion was taking place, he complained. He sought the cooperation of the Association members in evolving suitable measures to tackle the octroi problems. **Mr. Arun Doshi,** Honorary Secretary, CAMA proposed a hearty vote of thanks.

---

## ULTRAMARINE AND PIGMENTS

Ultramarine and Pigments has achieved a gross sales of Rs. 11.38 crores during the year ended March 1990 against Rs. 9.19 crores in the previous year. The other income is Rs. 3.66 crores against Rs. 1.94 crores. The gross profit is higher at Rs. 4.47 crores against Rs. 3.92 crores. Due to higher provision for taxation of Rs. 1.31 crores against Rs. 0.82 crores, the net profit is marginally higher at Rs. 2.62 crores against Rs. 2.59 crores. The company has pro posed a dividend of 40 per cent against 30 per cent paid last year

FOR YOUR REQUIREMENTS OF:

**REACTIVE "HE" DYES**

Red HE 8B
Yellow HE 4G
Navy Blue HE 2R
Green HE 4B

(Export Enquiries Solicited)

**AUXILIARIES**

Polyvinyl Acetate Emulsion
Polyester Khadi
Cotton Khadi
Amino Silicon
Dye Fixing Agent
O.T. Liquid

Contact Manufacturers:

**Shree Vinayak Industries**

2, Violet-Villa, West Avenue Road, Santacruz (West) Bombay 400 054
**Phones: 540460, 6495100, 6461069**

MBX
P.E
K.V.S
Binder
A.M.H
Fixer

TRUSTED NAME IN CHEMICALS

**B.D. ASSOCIATES**

70/B, Santoknagar Society, Opp. Roses Garden, Old Channi Road, Baroda 390 002.

CHLORANIL
META DINITRO BENZENE
SULPHANILIC ACID
SODIUM BISULPHATE
CALCIUM CARBONATE
PRECIPITATED SILICA
SPENT SULPHURIC ACID
H. ACID

Only for Ankleshwar

SULPHURIC ACID
OLEUM 65% & 23%
CHLORO SULPHANILIC ACID

**Tel.: (R) PP 22300**

FOR YOUR REQUIREMENTS OF
(Available in Drums & In Tanker Load)

TOLUENE (N.G.)
BENZENE (N.G.)
XYLENE (Ortho/Para/Mix)
SOLVENT C-IX (Crude/Distilled)
METHANOL
FORMALDEHYDE 37%
ACRYLONITRILE
ACETONITRILE
N-HEXANE (Food Grade)
I.P.A.
DIACETONE
ACETONE
MIBK
BUTANOL (Iso/Normal)
P.E.G.
D.E.G.
M.E.G.
M.E.K.
METHYLENE CHLORIDE
FORMIC ACID
HYDROGEN PEROXIDE
PROPYLENE GLYCOL
PHENOL (Liquid/Crystal)
E.D.C.
MONOMERS &
OTHER INDUSTRIAL CHEMICALS

Please Contact:

**GAYATRI ENTERPRISES**

341/43, Katha Bazar, N.N. Street, Bombay 400 009.
Tel.: (O) 339744, 329188 (R) 5136564, 5132747

# German Remedies reports improved performance

rman Remedies has achieved a kable turnaround in the last couple ars and has declared a 20 per cent end for the year as well as a 1:1 s issue.

ie secret of its success, according e chairman, Mr. H.K. Bilpodiwala exports, or rather its wholly owned idiary GR Exports Ltd. — incorted in 1989. The company during irst year of existence has recorded xport sales of Rs. 10.80 crores with its almost amounting to 50 per cent ales at Rs. 4.54 crores. Sales cum er income was Rs. 12.34 crores. ce the sales was entirely through orts, there was no tax liability.

The company has paid out an increde total dividend of Rs. 1,270 per uity share of Rs. 100. Since the comny has no production plants, the penditure was negligible except for erest and other expenses. Of the total hount available for appropriation, the mpany transferred Rs. 50,000 to genal reserve and the balance was paid it as dividend.

The company however does not eveal the products that have found such tremendous export market except to tate that pharmaceutical preparations vere exported. The chairman however ointed out to the shareholders that xports can be a fickle friend — particularly the Russian market in which the company mainly operates. A leading international antibiotic — Augmentin — has been one of the company's strong selling points — it is a product of Beecham U.K.

The parent company — German Remedies has also been strong on exports during the year, particularly to neighbouring countries. It has also exported products to Germany. However, the parent company's exports have done nothing for the balance of payments position with foreign exchange outgo placed at Rs. 19 crores as against an earning of Rs. 8.71 crores.

According to reports, exports are booming this year and may be even higher. However, the company is very pessimistic about domestic sales, stating that the outlook for the pharmaceutical industry in the domestic market is indeed very bleak.

---

## INDONESIA ASSURES OIL SUPPLIES

OPEC member Indonesia said that members of the Organisation of Petroleum Exporting Countries will take measures to ensure supplies of oil in view of the UN embargo on oil exports from Iraq and Kuwait. According to a report, India has approached both Malaysia and Indonesia for oil imports.

One-third of India's imported oil comes from Iraq. The Indonesian Energy Minister Mr. Ginandjar Kartasasmita, said his country has assured supply of oil to developing countries dependent on supplies from Iraq and Kuwait. Mr. Ginandjar said most OPEC countries had agreed that the world should use stockpiled oil instead of pressing producing countries to increase output.

Indonesia would give priority to supplying oil to the Philippines. Indonesia currently exports some 700,000 barrels per day of crude oil, mostly to Japan, from its present output of 1.377 million bpd set by OPEC.

Mr. Ginandjar said Indonesia had raised the export price of its bench mark "minas" crude oil from its lowest level of $14.81 a barrel last month to $19.19 a barrel this month. He predicted the price would surge further due to the prevailing situation in the Gulf region.

For Your Requirements Of:

**BENZYL CHLORIDE**
**BENZOYL CHLORIDE**
**BENZO TRI CHLORIDE**
**BENZALDEHYDE**

Contact Manufacturers:

**Shubham Aromatics Limited**

Factory:
Birlagram,
NAGDA (MP) 456 331
Phone: 283/104

Regd. Office
29, Bank Street, Ist Floor,
Bombay 400 023.
Phone: 2862453/2863021
Gram: "METALDIST"
Telex: 011 - 6554 MINA IN

**Available Regularly at Most Competitive Prices**

**Acetone**
**Acetic Acid Glacial**
**Aluminium Sulphate**
**Butyl Acetate**
**Butyl Acrylate Monomer**
**Carbon Tetrachloride**
**Caustic Soda Solid/Flakes**
**Copper Sulphate**
**Citric Acid**
**Di Ammonium Phosphate**
**Di Ethylene Glycol**
**Formaldehyde**
**Formic Acid**
**Gohsenol GH-17**
**Gold Bronze Powder**
**Hydrogen Peroxide**
**Hydrosulphite of Soda**
**MCA (Monochloro Acetic Acid)**
**N Butyl Alcohol**
**Oxalic Acid 98/99%**
**P.V.A. 173, P.V.A. 208**
**Polyethylene Glycol**
**Potassium Carbonate**
**Potassium Bichromate**
**Rangolite C**
**Sorbitol Liq.**
**Sodium Bicarbonate**
**Sodium Alginate**
**Sodium Bichromate**
**Sodium Nitrite**
**Sodium Perborate**
**Sodium Sulphide Flakes/Solid**
**Sodium Meta Silicate**
**Titanium Potassium Oxalate**
**Titanium Dioxide**
**Trisodium Phosphate**
**Triethanolamine**
**Urea Technical Grade**
**And other chemicals**

Please Contact

**TRIBHOVANDAS KHIMJI & BROS**

Mangaldas Building No. 5,
36, Trikamji Ghia Marg,
(Kitchen Garden Lane)
Bombay 400 002
**Phones: Off.: 310132/311385**
**Resi: 355044**
**Grams: "SARKEV", Bombay-2**

***MORE THAN 70 YEARS OF SERVICE TO VARIOUS INDUSTRIES***

# Woolworth seeks to sell EOU yarn domestically

Woolworth India Ltd. has approached the Union Commerce Ministry for permission to sell worsted polyester viscose yarn manufactured at its Raipur-based 100% export oriented unit (EOU) domestically on an experimental basis. Promoted by the Uniworth group owned by the non-resident Lohias, Woolworth has petitioned the Government to allow it to test-market the yarn in excess of the stipulated limit (25%) allowed to EOUs for sale within the country. The test-marketing would be a one-time affair.

It is learnt that the rationale behind the Woolworth proposal was that it would soon have to import expensive raw material from Australia and Europe and, therefore, needed to test the efficiency of its Rs. 11-crore machinery before full-fledged exports were started. Though set up as a worsted woollen yarn unit, it was now using domestically acquired raw material to make yarn from polyester and viscose.

Although the Government has reportedly reacted favourably to the proposal, Woolworth would sell the accumulating yarn in small quantities within the specified limits if the sanction did not come through. The Raipur plant had already started production and full commercial output was expected to commence early September. Located at the Urla growth centre on the outskirts of the sleepy industrial Madhya Pradesh township, the plant enjoyed a licensed capacity of 7.78 lakh kg per annum with 5600 spindles.

Woolworth, however, had already started expanding its present spindleage. Mr. S. Gopal, President (Marketing) of the company said that enquiries had already come from European concerns and worsted woollen yarn had a large market in Europe. "At present finding markets is the least of our problems", he said.

According to Mr. Gopal, the plant would start off with production of "classical" woollen items and move on to the finer category later. It also had a quality control department which monitored whether the raw materials met the required specifications.

Mr. Gopal said the demand for woollens was on an upswing throughout the world. Among the major importers of the yarn were France, Italy, Germany, Spain, the UK and Japan. The European countries, having shifted emphasis to manufacture of fabrics and garments, were increasingly importing yarn, he added. This EOU, the first of its kind for manufacture of worsted yarn, is also assisted by the International Wool Secretariat (IWS) of the UK.

---

## THE G.D. BIRLA AWARD FOR APPLIED RESEARCH AND DEVELOPMENT IN MAN-MADE FIBRES: 1989-90

Entries are invited for the first Annual Award for outstanding achievements in the field of Applied Research & Development in Man-made Fibres for the year 1989-90. The Award, funded by M/s. Grasim Industries Ltd. and instituted and administered by the Bombay Textile Research Association (BTRA) aims to recognise and reward, prominent Indian talents in the field of Man-made Fibres working in various research institutes, CSIR laboratories, textile industries, R & D centres and other such institutions.

Scientists and Technologists, working in the field of spinning, weaving, chemical processing, instrumentation and textile mills management are eligible for the award. The award will be presented in February 1991 on the occasion of the International Conference on Recent Advances in Chemistry and Chemical Processing being organised by BTRA.

Detailed information regarding the award and the application forms will be available from: The Director, Bombay Textile Research Association, L.B.S. Marg, Ghatkopar (W), Bombay 400 086. Application forms duly filled should reach before 18.12.1990.

# All India Federation of Chemical Merchants constituted

Mr. B.S. Mehra, the Chairman of s. B.S. Mehra Sons Private Limited, lhi & Bombay has been elected as President of the Federation of All dia Dyes and Chemical Merchants sociation.

He is the Founder Member of Chemal Merchants Association, Delhi and as the Vice Chairman of the first All dia Dyes & Chemical Merchants conrence held at Madras.

He is the patron member of Chemal & Alkali Merchants Association, ombay and Karnataka Dyes & Chemcal Merchants Association, Bangalore. le is associated with his prime Princials M/s. Chemicals & Plastics India Limited, (formerly known as The Mettur Chemicals & Industrial Corporation Ltd.), for more than 20 years.

Formerly his area of operation was restricted to the North only.

**Mr. B.S. Mehra**

Later due to his good performance he has been given the charge of Bombay & Goa too in 1985.

**Attention: All the dyes & chemicals merchants associations of India**

The Federation of All India Dyes & Chemical Merchants Associations has been formed on 30th June 1990 at Bombay.

The members of the executive committee are:

Mr. B.S. Mehra, Delhi, President, Mr. Ramniklal S. Gosalia, Bombay, Zonal Vice President (West), Mr. L.P. Bhoote, Bangalore, Zonal Vice President (South), Mr. G.L. Agarwal, Calcutta, Zonal Vice President (East), Mr. Satya Narayan Khandelwal, Delhi, Hon. Treasurer, Mr. C.M. Shah, Bombay, Zonal Secretary (West), Mr. B.K. Gami, Delhi, Zonal Secretary (North), Mr. B.L. Porwal, Madras, Zonal Secretary (South), Mr. P.K. De, Zonal Secreatary (East), Mr. Suresh gupta and Mr. Suresh Kejriwal, Mr. N.C. Jain, Mr. Sunil Bansal, are members of C.M.A. Delhi, Mr. Shyam Sundar Sharma, Mr. Shyam Sunder Gupta Mr. Akhilesh Kumar Aggarwal, are members of R.R.V.S. Delhi, Mr. J.C. Parekh, Mr. S.K. Joshi, Mr. R. Natrajan, Mr. Arun Doshi are members of C.A.M.A, Bombay, Mr. Rohit Bhai P. Modi, Mr. S.G. Mehta, Mr. Bala Chand S. Shah and Mr. Naresh Asher are members of B.K.C. & C, Bombay Mr. Lingmurthi, Mr. Raju Nath Mehta, Mr. Gautham Metha, are members of T.N.D & C, Madras and Mr. Labh Chand Mehta, Mr. Bhagwan Singh, Mr. Sampat Raj are members of K.D. & C.M. Bangalore, Mr. G.S. Dhanajya, Mr. Purshottam Malani, Mr. B.N. Aggerwal are members of A.P.D.C.M,-Hyderabad, Mr. B.V. Nagori and Mr. M.K. Sangharia are members of A.P.D.C.M. Calcutta.

The Federation has called upon all Dyes and Chemical Merchants Association spread all over the country to enlist with the Federation.

Terms of membership are as follows:
Admission Fee Rs. 1500 for each association.

Annual subscription where members are:

1 to 50 ... Rs. 500/- per year. Representative : 1
50 to 250 ... Rs. 1000/- per year. Representative : 2
250 to 500.. Rs. 1,500/- per year. Representative : 3
500 and above ... Rs. 2,000/- per year. Representative: 4

Further details can be had from: the Federation of All India Dyes & Chemical Merchants Associations, C/o. The Chemical Merchants Association, 258, Kawtra Peran, Tilak Bazar, Delhi: 110 006.

---

## RIICO INVITES TENDERS FOR METHANOL PROJECT

Offers have been called by the Rajasthan State Industrial Development and Investment Corporation RIICO — for its Rs. 100-crore methanol project to be put up in the assisted sector.

Sources in RIICO say that the proposed project would be set up along the HBJ Pipeline in Kota or Bundi district.

The capacity of the plant will be one lakh tonnes of methanol per annum.

RIICO is also going ahead to tie-up the Rs. 22-crore, ABS resin plant to be put up in the joint sector.

The capacity of the project will be 5,000 tonnes per year and it will be located in Sirohi district, bordering Gujarat.

Sources revealed that RIICO would not be averse to associate some foreign company in putting up these projects.

The maximum equity could be however 40 per cent. Also under consideration are one or two more proposals to utilise gas of the HBJ pipeline at the earliest.

# Rise in technology payments to foreign collaborators

Though the number of collaborations for foreign technology has come down in the last five years, the technology payments to the foreign collaborations have increased. The number dropped from 1041 in 1985 to 605 in 1989. The technology payments in lumpsum for technical knowhow, dividends and royalty increased from Rs. 170 crores in 1980 to Rs. 484 crores in 1986-87. The current payment is estimated to be Rs. 500 crores.

These payments represent only the direct remittance to the foreign collaborator for technology transfer. Indirect payments are also made to the collaborator through the import of capital goods, assemblies, components and technical services.

The formal channels which are available to Indian entrepreneurs to obtain foreign technology are foreign collaborations (technical or technical-cum-financial), import of drawings and designs, import of capital goods and consultancy services and technology through the mechanism of technical development fund, and foreign experts.

A sectoral analysis of the foreign collaboration approvals from 1980 to 1989 shows that the maximum number of technology transfers were in the area of electricals and electronics followed by industrial machinery, mechanical engineering sector and chemical industries.

The country-wise analysis of the foreign collaborations approved in the last decade shows that the largest number of foreign collaborations were from the United States followed by the Federal Republic of Germany, UK and Japan.

A reliable source of supply for

- * High Exhaust Reactive Dyes
- * Vinyl Sulphone Based Reactive Dyes
- * Cold & Hot Brand Reactive Dyes

Current Additions

CCI Reactive Red HE3B
CCI Reactive Orange HER

Contact Manufacturer

COLOUR & CHEMICAL INDUSTRIES

**Office:** 44, Gaya Bldg., 4th Floor,
109, Yusuf Meharali Road,
Bombay 400 003.
**Phone: Off.: 345581, 341545**
**Res.: 6720195**
**Telex: 11 71227 CCI IN**

* WANTED AGENTS THROUGHOUT THE COUNTRY

The number of collaborations v
the US during this period was 1561,
FRG 1344 and Japan 700, accordin
the Department of Scientific and In
strial Research. By the utilisation
indigenous and foreign technology,
industry has grown steadily in the
decade and the index of industrial p
duction has reached 185.8 compare
100 in the base year, 1980-81.

Regarding technology absorption,
department noted that the product
technology had been acquired in m
of the cases resulting in indigenous p
duction as well as import substituti
There was however little technolo
absorption in the area of design ca
bility which could result in upgradat
of the existing products.

In a few exceptional cases, the u
had absorbed the technology very eff
tively and they had built up resear
development and design teams
upgrade their products even after exp
of the foreign collaboration agreeme
Some of the products which have b
indigenised by using foreign technolo
during this period include electro
equipment and components, perso
computers, high efficiency automobi
petrochemicals, synthetic fibres, me
brane cell technology for caustic so
a large number of drugs and drug in
mediates, selected consumer durab
high efficiency lamps and po
equipment.

The buying practices and policies
Indian companies and organisations
sometimes favourably disposed towa
a product made with proven technolo
and foreign collaboration, and theref
manufacturers have to seek collabo
tion before they are eligible to be c
sidered.

The department felt that this prac
should be discouraged because e
units which are self-reliant in terms
design capability and production te
nology are forced to go in for a te
nical back up which becomes redund

# rplus gas sought for southern region

Tamil Nadu Chief Minister, I. Karunanidhi, renewed his plea Centre to divert to the south the is gas which was being flared at bay High to meet the growing r demand of the southern States, ially Tamil Nadu. The Chief ster was inaugurating the propylene e, propylene glycol and polyol s of the UB Petroproducts Ltd., at ali, a joint venture project set up by Group and TIDCO, at Madras.

lthough Tamil Nadu was the only e in the country which did not have er cuts, the future power scenario grim. It would be difficult to meet projected demand taking into con eration the growth in population and ustries, he said. Mr. Karunanidhi said Tamil Nadu Electricity Board was nding at least an additional Rs. 100 res to Rs. 200 crores in lifting coal m Bihar and West Bengal. He had cussed this with the Union Energy nister, Mr. Arif Mohammed Khan, no was in Madras on August 11.

The Rs. 81 crore project will man acture 100 per cent import substitute trochemicals, that is, 12000 tonnes of opylene oxide, 8000 tpa of polyether olyols and 7000 tpa of propylene lycol. Mr. Karunanidhi reiterated his overnment's commitment to extend all upport to industrialists, both from vithin the State and outside, to invest n Tamil Nadu and at the same time romised them that industrial peace vould be maintained.

He said that at the time of assuming office he had promised to start an industry every month. But, the present situation was that more than one industry was being started every month.

**Foreign exchange crunch**

Presiding over the function, the Union Minister for Petroleum and Chemicals, Mr. M.S. Gurupadaswamy, said the National Front Government was faced with a serious foreign exchange crisis. "It is not our creation. It is the legacy of the past. Nevertheless, we have to meet the crisis and circumvent the crisis which can be done only by import substitution."

He said although considerable amount was being spent on R & D, it was still inadequate as there were gaps in technology. The Government was following a policy by which technology was imported to fill the gaps at present. The Centre wanted industries to absorb this technology and further improve on it so that it could be exported to other countries, he said. He said the Govt. was aware of the problems of industrialists who wanted early clearance of their projects. It had taken a series of steps to avoid delays and redtapism.

The Minister urged the industrialists to cut down on costs to make the industries competitive in the world market. "The Government is doing its best to streamline procedures to avoid cost overruns. We have wasted a lot of time in the past and we cannot afford it anymore." The Minister handed over a cheque for Rs. 40,000 on behalf of the UB Group to Mrs. Rekha Shetty of the Rotary Club of Madras Temple City for their 'Operation Daybreak', pertaining to higher education of Corporation School students.

Mr. Vijay Mallya, chairman, UB Group, said Tamil Nadu's industrial policy was a landmark as it offered incentives to spur industrial growth. He said the UB Group had a Rs. 400 crore butyl rubber project on the cards. Dr. R.C.K. Gupta, managing director, UB Petroproducts, said the three plants had been standardised and production would commence shortly. Importance had been given to the safety aspect and it had been incorporated in the design itself. The technical know-how for the project had been supplied by M/s. Pressindustria AG of Switzerland and M/s. Montedipe s.r.l. of Italy were the collaborators with an equity investment of 10 per cent.

Mr. K. Venkatesan, chairman, TIDCO, said UB Petroproducts would use the feedstock available from MRL. Dr. P. Straneo, chairman, Pressindustria A.G., said the plant was completely computerised and incorporated the latest safety systems. Mr. A. Swaminathan, president, Petrochemicals Division, UB Group, proposed a vote of thanks.

## CABINET CLEARANCE FOR KANDLA-BHATINDA PIPELINE SOON

The Petroleum and Chemicals Minister, Mr. M.S. Gurupadaswamy, has said he is hopeful that the Kandla-Bhatinda project pipeline would be cleared by the Govt. at the earlier. The matter is now pending before the Cabinet for final clearance, he said. Since the railway line on the same track has already been cleared by the Government and there is a positive thinking that both lines could co-exist, Mr. Gurupadaswamy said he was hopeful of its early clearance.

The pipeline, perhaps the most prestigious project proposed by the Indian Oil Corporation after Gas Authority's HBJ pipeline, is expected to meet the petroleum product requirements of the entire north-western region. The project ran into rough weather when the Railway Ministry strongly opposed the Petroleum Ministry's proposal for the railway line and it feared that it would cut into its freight revenue.

## APPOINTMENTS

**Mr. Jagdeesh M. Mehta** has been appointed managing director of National Rayon Corporation Ltd. **Mr. H.R. Patankar,** chairman and managing director, Gujarat State Fertilizers Company Ltd., Vadodara has been elected chairman of the Fertilizer Association of India (western region). **Ms. J. Lalithambika** has taken over charge as chairman, Rubber Board (Ministry of Commerce, Govt. of India), Kottayam.

ATTENTION!
TEXTILE MILLS AND PROCESS HOUSES
For Your Requirement Of
PRINTING ADHESIVES
for Flat Bed and Rotary Machines
TECHNOVA TRACING FILM
RTF and BLD

Contact Manufacturer:
**BHARATI & CO.**
Plot 394 D-7, Shradhanand Road, Matunga, Bombay 400 019.
Tel.: 4375582/4371701

---

Attention
Manufacturers of -
DYESTUFF INTERMEDIATES
* * *
Interested in placing bulk orders on regular basis for
ZINC HYDROXIDE
Available from your processing house
* * *
Please write with details:
**BOX NO. 1262**
CHEMICAL WEEKLY
306, Shri Hanuman Industrial Estate.
G.D. Ambekar Road, Wadala, Bombay 400 031.

---

FOR YOUR REGULAR REQUIREMENTS OF:
BON ACID
(Manufactured By: NEWPAR AROMATICS P. LTD.)
Please Contact:
**P.D. SALES CORPORATION**
206/A, Matru-Chhaya, 378/80, Narshi Natha Street, Bombay 400 009.
Phone: Off.: 347430 Resi.: VIRESH MEHTA 5617576 PRADIP SHAH 5139539
WE ALSO OFFER
* 2:5 Dichloro Aniline (Fast Scarlet GG Base)
* Meta Chloro Aniline
* P.C.A.
* P.N.C.B.

OURCES FOR EIGHTH PLAN

# Fuel efficiency in industry can raise Rs. 25,000 Crs.

n enormous sum of Rs. 25,000 s would be available additionally unding the Eighth Five Year Plan, nly industry used fuel efficient pment, according to Mr. K.L. Puri, er adviser on energy conservation e Cabinet secretariat.

he country is losing about Rs. 5,000 es annually due to inefficient pment and the Indian planners ld get Rs. 25,000 crores in the next years if industry became energy scious Mr. Puri said.

Ir. Puri, a crusader against energy stage, said a mere five per cent provement in plant load factor would ble the country have additional 4,000 power annually. To set up 4,000 of power generation capacity in the ntry, the country would require at st Rs. 5,000 crores, he said and asked we could get this much power with- t spending any money what was the rm in going all out to save it.

In this connection he welcomed the overnment's proposal to have a sep- ate department for energy conserva- on and said there had to be an tegrated approach as in Japan and outh Korea which had done extremely ell on energy conservation in the last ew years. Mr. Puri, former chairman of harat Heavy Electricals, who repre- ented India in the recent Bellagio Italy) seminar on energy conservation, aid it was impossible to achieve sus- ainable development along present nergy paths and that environmental and apital constraints require cleaner and ess wasteful energy use in all countries.

He quoted the unanimously agreed statement at the seminar to say that central to any sustainable development strategy was the efficient use of energy, for which the economic, environment, efits were vast and far larger than commonly recognised.

Existing technologies and practices, particularly for end-use efficiency, offer to save billions of dollars, catalyse development and mitigate the profound environmental and human welfare problems facing the world, a group of 23 energy policy makers who attended the seminar said in the statement. Mr. Puri said the strategy should be that national, regional and local governments should adopt policies to implement comprehensive energy efficiency programmes across all sectors.

This would require major new commitments, the possible creation of new government institutions at the highest level, new incentives that reward efficient behaviour by producers and consumers of energy services and regulations that establish efficiency standards, Mr. Puri said.

## JB CHEMICALS

JB Chemicals and Pharmaceuticals has fared well during the current year. For the first four months i.e., April to July of the current year, sales have gone up to Rs. 24.05 crores from Rs. 12.93 crores, registering a growth of 86 per cent over the corresponding period last year.

The company has also procured substantial export orders worth Rs. 16.94 crores during the current year. The performance and the results of the company will be more encouraging in the current year, according to Mr. J.B. Mody, Chairman and Managing Director of the company.

Addressing shareholders at the company's annual general meeting in Bombay, he said that considering the very good market for the drugs and pharmaceutical production in the foreign countries, the company was putting more and more efforts to capture good share of the export market thereby increasing its export turnover. During 1991 and the years to come thereafter the export turnover of the company will be on the increase. He said that the company had acquired some equity shares of Ifunik Chemicals Ltd., (ICL) and has also been allotted rights shares. After the recent allotment of rights shares, ICL had become a subsidiary of the company. It had already commenced its business activities and expected to increase its business on a big scale shortly. By this investment the company would be placed in a more advantageous position in increasing its income.

The company is planning to manufacture in India, in technical collaboration with Hafslund Nycomed of Austria, a special pharmaceutical formulation developed by them which is excellent for healing wounds. The company had also completed the clinical trials of various new formulations which are useful for treatment of hyper-tension. These products would be marketed in due course he said.

## AMINES AND PLASTICIZERS

Amines and Plasticizers has reported a turnover of Rs. 17.64 crores for the 12-month period ended March, 1990 against Rs. 20.81 crores in the previous period of 15 months. The working results show a gross profit of Rs. 182.04 lakhs before providing for interest of Rs. 140.39 lakhs and depreciation of Rs. 259.25 lakhs.

The operating profit for the year has been lower at Rs. 11.3 lakhs against Rs. 9.97 lakhs. After adding previous period's brought forward profit of Rs. 8.97 lakhs and income-tax refund of 0.25 lakh of earlier years and making provisions for investment allowance of Rs. 0.17 lakh and taxation of Rs. 1.86 lakhs, the amount carried forward is Rs. 18 lakhs.

# PIB approves development of Neelam oil field

The Public Investment Board (PIB) on August 9 cleared a proposal for the full development of the Neelam oil field in Bombay High, at a cost of around Rs. 2,080 crores. This the first major oilfield development project sanctioned after the present government took over.

The Neelam oil field, located about 45 km southwest of Bombay, has already been producing oil since March this year, at a rate of about 10,000 barrels a day. One of the largest in the Bombay High, it has a potential to generate about four million tonnes of oil annually. It is expected to produce about 11.5 million tonnes of oil during the entire Eighth Plan period. The field has estimated geological reserves of about 150 million tonnes.

Currently, production at the Neelam field has been organised with temporary deck facilities for four wells from where well fluids are being sent to the adjoining Heera field for processing through a subsea pipeline. Now, with full development being cleared, the Oil and Natural Gas Commission (ONGC) plans to drill about 100 oil wells and connect them to 12 well platforms, from where they will move further on to a process complex. The process complex is envisaged to have provision for water injection facilities from the beginning itself to maximise recoveries.

At a later stage, the ONGC proposes to construct two water injection well platforms, a process platform complex for oil and gas processing and water injection facilities, besides a network of submarine pipelines for well fluids, water injection and gas lift facilities. The process platform complex is being designed to handle oil of upto six million tonnes annually, while the water injection process platform would handle about 2.3 lakh barrels of water a day.

There is also a proposal to construct pipelines for transportation of oil and gas through the Heera-Uran trunk lines.

---

## GUJARAT CM PLEA ON GAS PRICING

The Gujarat Chief Minister, Mr. Chimanbhai Patel, has pleaded with the Prime Minister, Mr. V.P. Singh, to reject the Vijay Kelkar Committee report on pricing of gas. Mr. Patel said that the committee had adopted a wrong principle on pricing of gas.

The committee, in its report submitted to the Union Government recently, has suggested an annual increase of Rs. 200 per 1000 cubic metre for next three years. As per the recomm dations of the committee, the price offshore natural gas should be fixec Rs. 1,600 per 1000 cubic metres u March 1991, Rs. 1,800 per 1000 cu metres upto March 1992 and Rs. 2, per 1000 cubic metres thereafter, Patel said.

The committee had recommend that Gas Authority of India Ltd. (GA be allowed Rs. 850 per 1000 cu metre as transportation cost for gas s plied through the pipeline, he said. these recommendations are accepted would adversely affect the developm of the State. "Industries cannot aff to buy the gas if the recommendati were implemented", the Chief Min ter added.

---

## COCHIN REFINERIES BAGS SAFETY AWARDS

The public sector Cochin Refiner Ltd. has bagged two oil industry saf awards for the year 1988-89. T awards are for the best overall saf performance under the group proc and production organisations and for best overall safety performance un the group refinery installations.

The awards will be presented by Petroleum and Chemicals Minister the oil industry seminar next mont

For your requirements of:

NICKEL OXIDE - 37% Ni
NICKEL AMMONIUM SULPHATE
NICKEL NITRATE
NICKEL OXALATE
COPPER OXALATE
SODIUM SULPHIDE (FLAKES)
CADMIUM BORATE

CADMIUM OXIDE - 45% Cd
CADMIUM CARBONATE
CADMIUM OXIDE (BROWN) 87% Cd
CADMIUM PHOSPHATE
CADMIUM NITRATE
CADMIUM CHLORIDE
CADMIUM OXALATE

Please Contact:

ARVIND CHEMICALS

**Factory:**
I.B. Patel Road, Goregaon (East),
Bombay 400 063.
T. No.: 6732666

**Office:**
212/5, Jawahar Nagar, Saraswati Bhuvan,
2nd Floor, Road No. 14, Goregaon (W),
Bombay 400 062. T. No.: 6722179

# Soviets urged to supply more crude

dia is pressing the Soviet Union, ysia and Indonesia to supply addi-l crude oil and petroleum products fset any disruption in supplies from ait or Iraq, the Petroleum Minister, M.S. Gurupadaswamy, has said. If Gulf crisis spreads to Saudi Arabia he United Arab Emirates hitting plies from there, India will face a ous situation, he said.

he Minister said that contingency ns are being drawn to ward off any uption of oil supplies in the wake of alating crisis. He warned that the entory built up by the domestic oil npanies by buying crude and petrol-n products in the spot market before crisis would last only five weeks.

Mr. Gurupadaswamy said he has ked the Finance Ministry to release mediately Rs. 3,000 crores to meet e increased cost of oil imports trig-ered off by the Iraq-Kuwait conflict nd the OPEC accord to jack-up crude rices to $21 a barrel from the current 18. But that was just one dimension of e problem, he said.

A major problem is to prevent disrup-ion in supplies. What if the foreign xchange is available but not oil, he sked. “We have a ship to come from raq and Kuwait this month. Because of he conflict, we may not get supplies this month,” he said.

The Soviet Union, he said, supplies Basra crude from Iraq under a barter agreement. “Because of the conflict Iraq may not supply that crude to the Soviet Union. But we have taken up the matter with the Soviets and asked them to try and get at least that quantity of oil which we ought to get from them. Also, Malaysia and Indonesia have talked about their commitment to Japan but we are pursuing the matter”, he said. Mr. Gurupadaswamy said, “this is why there is total uncertainty on this aspect”. Referring to the UN resolution on sanctions against Iraq and Kuwait, the Minister said, if Russia and other countries observe the oil membargo against these countries, we have to fall in line with the international community.

“If we deviate and import oil from Iraq, we may be branded as a country which will not fall in line with the international community”, he said. The Government will take all steps to ensure adequate supply of oil, but there was uncertainty, he said. “People will have to be aware of this uncertainty and we have to be prepared for meeting this contingency that may arise in the future”, he said. “There is no need for panic. But this is a crisis we have to manage, this is a national issue and not a party issue”, he observed.

The Minister appealed to the people to co-operate with the Government. Industry, trade, agriculture and all undertakings and State Governments should also help conserve oil and restrain oil consumption. The Minister said the Government had asked him to adhere to the target of foreign exchange of Rs. 6,440 crores fixed for last year.

“If I adhere to that, there will be a negative growth of 1.1 per cent. Last year, there was a positive growth of eight per cent in the demand for petroleum products” he said. The Minister said he could not meet increasing demand leave alone the existing one. “Even, last year's demand cannot be met fully because of the variation of rupee value in terms of dollar”, he said.

Mr. Gurupadaswamy said the rupee value in terms of the dollar had declined. Asked if there was any difference in perception of the oil crisis between him and the Finance Minister, Mr. Gurupadaswamy said there was none. He (Mr. Dandavate) has said we have built up good inventories and that there is no alarming situation. I am also saying there is no need to panic because of these inventories now.”

“But I am warning the nation of the uncertainty in supplies because these inventories will last for only five weeks”, he said. He also referred to reports in the press that the country had lost out on the opportunity to save about $80 million (about Rs. 140 crores) by not purchasing about a million tonnes of crude in the spot market when prices were low before the Gulf crisis and said “this is wrong and a total distortion of facts”.

He said misleading information was given to the press through certain quarters. Crude was purchased in the spot market at $14 to $15 per barrel and inventory was full at more than 2-1/2 million tonnes already. “We have filled up the capacity. No more capacity is available now. He said adding, “while it is not true that we have not taken care, we have taken care.”

By purchasing oil in the spot market foreign exchange to the extent of Rs. 340 crores had been saved and it was a wise decision. India will require close to 20 million tonnes of crude and petroleum products this year, including about five million tonnes of POL (petroleum, oil and lubricants).

The Government varies its imports in the form of term contracts and spot purchases and changes the mix every year as part of its buying strategy. Of late, according to informed sources, the old formula of fixed rate purchase in term contract is not available. But friendly countries still extend some concessions selling a little below the market price, sources said.

According to projections, India will require about 60 million tonnes of crude and petroleum products in 1990-91. The total import of oil and petroleum products next year is expected to be Rs. 8,300 crores. For the entire Eighth Plan, the demand for imports will be about 150 million tonnes involving a foreign exchange outgo of about Rs. 40,000 crores.

### LOW-GRADE ORE AS FEEDSTOCK

# Fresh interest in TN sponge iron project

Hopes have been revived on the issue of setting up a sponge iron plant in Tamil Nadu using the low grade iron ore reserves in the State. At long last, the substantial deposits of iron ore found in Tiruvannamalai, so far neglected, because of poor metal content, is engaging the attention of the State Government and a few steely entrepreneurs.

Renewed interest in this area stems not from the popular notion that it can meet the growing pig iron shortage in the South. Its primary attraction is the large number of electric arc furnaces (EAF) in the region, which, of late, have been running short of raw material.

The tentative proposal is to instal a sponge iron plant in Cuddalore with a capacity of 1.2 lakh tonnes a year in two modules of 60,000 tonnes each. To start with, lignite from Neyveli will be used as reductant fuel for the purpose. The idea is to make the plant gas-based once ONGC taps the PY-3 series of on-shore and off-shore structures.

The project is expected to be implemented in two phases. In the first phase lasting for about two years, the plant will be run on high grade iron ore pellets from Kudremukh brought to Cuddalore by a sea route. By that time, the Tiruvannamalai mines will be ready for exploitation.

Geological studies have certified that Tiruvannamalai ores can be depended on to be used as feedstock for a sponge iron unit. A detailed exploration survey conducted by the State Department of Geology and Mining in the early 70s put the total reserves in the region at 62 million tonnes. Recognised institutions like Australian Mineral Development and Exploration and Sponge Iron India Ltd have tested samples of the ore and given it a clean chit. According to Mr. J. Purushothaman, Additional Director, State Department of Geology, although the Tiruvannamalai ores contain only 35 per cent iron, they possess certain inherent advantages. Its phosphorous content is low, titanium level negligible and sulphur practically nil.

As for the desirability of using lignite as reductant fuel, it is pointed out that previous experiments in this regard within the country have met with success. The total reserves in Neyveli is placed at 3000 million tonnes. It is estimated that one tonne of sponge iron needs 0.9 tonnes of lignite as reductant fuel.

In Madras, Mr. K.C. Khanna, former Chairman of SAIL, pointed out that the use of low grade ore available in Tamil Nadu had never been ruled out. It, however, can never form a base for integrated steel plants because of the high cost of fuel. The availability of natural gas has changed even this outlook. Apart from Tiruvannamalai, another potential place is Kanchamalai in Salem District, he said. Based on a comparative analysis of similar investments in the country, the Cuddalore project is estimated to cost Rs. 100 crores. The first phase envisages to produce sponge iron at a cost not exceeding Rs. 2,500 a tonne.

The turnover in the very first year is projected at Rs. 50 crores, going by the prevailing market price of Rs. 4,250 per tonne. A minimum net profit of Rs. 20 crores is anticipated after providing for raw material cost, interest on loans and investment on machinery.

At the end of three years, the accumulated profit of Rs. 60 crores can be invested for mining operations in Tiruvannamalai and for setting up a concentration plant near the mines. The dependence on Kudremukh ore is expected to last at the most for three years. According to industry observers, the country will have to go in for additional production of sponge iron to mee the present and future needs of mini-steel plants.

At present, the local availability o scrap is estimated at 2.75 million tonne as against the total demand of 6.3 million tonnes. As much as 2.3 millio tonnes is met through import (Rs. 5,000 per tonne), which is a drai on the exchange reserves.

In this scenario, the focus is necessarily on augmenting the sponge iro production. For the current year, si sponge iron plants which have alread gone on stream are likely to produc 1.04 million tonnes totally, which is a far cry from the shortfall of 3.65 million tonnes.

Among the users of sponge iron ar mini-steel plants with EAFs, integrate steel plants and casting units to a limited extent. While the number of stee producers in the secondary sector ha gone up sharply, there has been no corresponding rise in sponge iron making capacity.

This is particularly so in the southern region, where there is a fair concentration of EAFs. The total number of EAFs presently stands at 26 with Karnataka accounting for as many as 11. Out of the remaining, seven are in Andhra Pradesh, five in Tamil Nadu, two in Kerala and one in Pondicherry.

All these plants are reported to be utilising just 50 per cent of their capacity. While power shortage is stated to be partially responsible for their poor performance, non-availability of raw material is also a contributing factor. A sponge iron plant in the South, it is pointed out, can to some measure help these units. The contention that sponge iron can be a solution to the chronic pig iron shortage faced by the foundries in the region does not, however, seem to have many takers. Foundrymen stoutly oppose the view that sponge iron can be a substitute for pig iron. The absence proven technology to sell this idea e main reason why earlier propo- for sponge iron plants in the State d not take off. The latest instance in 1985 when the proposal for a t sector plant between TIDCO and P Ltd., was dropped.

ndustry circles claim that suitable nnology for this is available abroad l foundries can benefit through them hey put up additional facilities. Until ch time, the utmost they could do is use at least 20 per cent of sponge iron ng with pig iron and scrap for king castings. This way, they can luce their dependence on pig iron.

## M REVIEWING COAL ROJECTS

The Prime Minister is reviewing ome of the major coal projects in the ountry with a view to ensuring their nplementation within the sanctioned osts:

The Energy Minister, Mr. Arif Mohammed Khan, told MPs at the Consultative Committee meeting of his Ministry in Delhi on Aug 8th, that the Government sanctioned 26 coal projects, including 15 advance action schemes in 1989-90.

The Department of Coal has been delegated powers to sanction advance action schemes for coal and lignite projects upto Rs. 10 crores wherein the estimated capital investment is expected to be Rs. 50 crores and above.

During the same period three major projects, namely, the Janata open cast of Northern Coal-fields of 10 million tonnes capacity per annum, Rajrappa open cast of Central Coalfields of three million tonnes capacity per annum and the Gevra open cast project of Southern Eastern Coalfieds of 10 million tonnes capacity, were completed. Mr. Khan said the working group of the Planning Commission on coal and lignite has estimated the total demand of coal in the terminal year of the Eighth Plan (1994-95) at 320 million tonnes. To meet this demand, a production target of 304.45 million tonnes has been suggested for CIL and SCCL mines and 5.86 million tonnes for TISCO, IISCO and DVC mines.

During 1989-90, coal production in the country was 200.87 million tonnes as against the target 209.50 million tonnes, the shortfall being mainly in ECL, BCCL, he said.

For the current year the production target has been fixed at 221 million tonnes (CIL 194 million tonnes, SCCL 22.50 million tonnes and others 4.50 million tonnes). The Plan allocation for the current year is Rs. 2305 crores (CIL Rs. 2031 crores, SCCL Rs. 274 crores). During the first quarter of the current year coal production from CIL was 93.2 per cent of the target. SCCL's achievement during the first quarter was 76.5 per cent of the target.

The Energy Minister said coal production this year is not upto expectations, although it has been higher than last year. The main reasons given by CIL are frequent disruptions in power supply, flooding of mines and absenteeism. Major shortfalls in production are in the Bengal-Bihar coal-fields, which suffered due to a major power breakdown in the eastern sector.

The Minister informed members that during 1989-90, the Neyveli Lignite Corporation produced 11.23 million tonnes of lignite against the target of 10.46 million tonnes. Gross power generation went up to 7386 million units against the target of 6918 million units. The capacity utilisation exceeded 100 per cent in both mining and power generation.

The Corporation has been making profits since 1976-77. It earned a profit of Rs. 77.32 crores during 1989-90 also. He said currently two lignite mines of six million tonnes and 4.7 million tonnes per annum capacity and two thermal power stations of 600 mw and 630 mw installed capacity are functioning at Neyveli. These contribute to a significant extent to the power supply in the southern region.

Expansion of the second mine to 10.5 million tonnes per annum production capacity and of the second thermal power station (TPS) to 1470 mw are in progress. The 400-KV transmission system for evacuation of power from the second TPS expansion is also in progress.

## OIL PROBE PACT WITH USSR

The eighth meeting of the Indo-Soviet working group on co-operation in the field of oil industry concluded in Delhi on Aug 3 with the signing of the protocol by Mr. A.K. Mukhametzianov, Deputy Minister of Oil and Gas Industry of the USSR and Dr. Madhav Godbole, Secretary, Petroleum and Natural Gas.

The protocol marks the end of the successful round of negotiations delineating the future course of co-operation between Indian and the Soviet agencies in the field of oil exploration.

The protocol provides for the detailed programme of work in the intensive integrated exploration projects in the North Cambay and Cauvery basins. It also provides for the speeding up of the pace of data acquisition for the projects in the West Bengal basin. A detailed programme of seismic survey in West Bengal was also handed over to the Indian side by the Soviet delegation during the meeting.

The protocol also provides for training of Indian experts in the USSR and the establishment of a computer centre at Jorhat. Both sides have also agreed to continue their efforts with a view to achieving maximum operational efficiency so that the ultimate aim of establishment of commercial reserves at the minimum cost is achieved at the earliest

## NEW MINERAL POLICY

# 13 strategic items reserved for exploration by Government

The new national mineral policy for non-fuel and non-atomic minerals has reserved 13 strategic minerals for exclusive exploitation by the goverment. The new policy, laid on the table of the Rajya Sabha by the Union Steel and Mines Minister, Mr. Dinesh Goswami on August 9, stipulates that the state shall continue to play a significant role in the mining and processing of minerals.

The reservation of 13 minerals to the state domain would, however, not preclude the state from securing the cooperation of private enterprise. There will also be ordinarily no bar to private mining of small deposits. The development of minor minerals would be undertaken ordinarily through the initiative and enterprise of the private sector though it would be open to the state enterprises to mine and process them.

In respect of all other minerals, the state shall continue to play an active role in their mining and processing. At the same time, private enterprise will also have opportunity to develop this field either on its own or with state participation, the policy document said.

The exploration and processing of minerals reserved exclusively for the state are iron ore, manganese ore, chrome ore, sulphur, gold, diamond, copper, lead, zinc, molybdenum, tungsten ores, nickel and the platinum group of metals.

New mining leases would not be granted without a proper mining plan that takes into account the environmental aspects, according to the new policy. There has to be a proper mining plan including the environmental management plan to be approved and enforced by statutory authorities, irrespective of whether the party is from the public or private sector.

The environmental management plan should adequately provide for controlling environmental damage, restoration of mined areas and for planting of trees according to prescribed norms. Reclamation and afforestation would proceed concurrently with mineral extraction, the policy says, adding that, efforts would be made to convert used mining sites into forests and other appropriate forms of land use.

Efforts shall also be made to export minerals in value-added form and the indigenous mineral industry shall be attuned to the international economic situation. Besides, the policy attempts to strike a balance between conservation and mineral development. Tabling the policy in the House, the minister said the basic thrust of the policy was to bring about 'optimal and economical use' of the 'finite and non-renewable mineral wealth through proper management'.

The basic objective stated in the policy is to promote necessary linkages for smooth and uninterrupted development of the mineral industry with due considerations and ensure their adequate supply and best use keeping in view present needs and future requirements.

Besides promoting research and development in minerals, it will ensure the establishment of appropriate educational and training facilities for human resources development to meet the manpower requirements of the mineral industry, the policy statement said. The policy says the guiding principle in the strategy of development of any mineral or mineral deposit at any location shall ordinarily be the economic cost. But the state may undertake development of any mineral or mineral deposit in public interest to ensure unhindered availability of raw material for the realisation of national goals.

As minerals are exhaustible and no
renewable, the exploitation and deve
opment of each mineral shall be f
mulated and reviewed periodically o
the basis of available resources. A thru
is to be given to exploitation of min
eral resources in which the country
well endowed so that industries base
on these resources can come up to me
the needs of the industrial materials f
which 'we have now to depend o
external resources'.

An optimal depletion rate shall als
be worked out in respect of each min
eral, keeping in view the domestic an
global resource position, the interna
tional market situation, and the needs f
stable and sustained economic deve
opment, the policy states. The polic
says the best use of available miner
resources shall be ensured by adopting
during the mining operation, effectiv
measures for conservation and benef
ciation, recovery of associated mine
als, and later by efficient processing o
minerals.

There shall be an adequate and effec
tive legal and institutional framewor
and commitment to prevent sub-optima
and unscientific mining, according t
the policy. It says conservation of min
erals shall be construed not in th
restrictive sense of abstinence from con
sumption or preservation for future use
but as a positive concept leading t
augmentation of the resource bas
through improvement in minin
methods, beneficiation and utilisation o
low grade ore and rejects, recovery o
associated minerals and reduction in the
requirement of mineral per unit of mineral output.

The policy says conditions of mining leases regarding tenure, size, shape, disposition with reference to geological boundaries and other mining conditions shall be such as to favourably predispose the leased areas to systematic and complete extraction of minerals. It also says studies for fixation of productivity norms and goals will be undertaken.

an important conservation mea- recycling of metallic scrap like copper, aluminium, zinc and lead, be encouraged along with the utili- n of low-grade minerals, mineral es and rejects. The policy says in context of the changing mineral ario and the economics of mineral elopment and products, both at the onal and international levels neces- fiscal changes will be made from e to time consistent with the general structure.

An appropriate mechanism for coor- ating the survey and exploration of deep-seabed area will be established the department of ocean develop- nt. The policy stresses the need for velopment of infrastructural facilities mineral-bearing areas following an egrated approach for mineral devel- ment, regional development and also cial and economic uplift of the local pulation, including tribals. Induction foreign technology and participation exploration for high-value and scarce inerals shall also be pursued. In case joint ventures, the controlling inter- st will remain with Indian companies. teps will also be taken to facilitate nancing of mine development, it says.

The policy says the regulation of nines and development of mineral esources shall continue to be the esponsibility of the Central and State Governments. It says the Central Government, in consultation with the State Governments, shall continue to formulate the legal measures for regulating mines and minerals resources development. The state will also ensure that basic uniformity in mineral administration and development of mineral resources keeps pace with the national policy goals.

## MEP FOR PSYLLIUM HUSK ABOLISHED

The minimum export price (MEP) for psyllium husk, an agricultural product [illegible] has been abolished following requests from the exporting community. At a recent open-house meet conducted by the Basic Chemicals, Pharmaceuticals and Cosmetics Export Promotion Council (CHEMEXCIL), at Ahmedabad, exporters had requested the special secretary in the Ministry of Commerce, to lift MEP "in the interests of boosting exports".

The Sidhpur-Unjha belt of Gujarat holds the global monopoly in psyllium husk, an item which fetches around Rs. 50 lakhs worth of exports every year, mostly to the United States. Processed foods made from psyllium husk (especially Procter & Gamble's *metamucil*) are becoming very popular in the US as the product is believed to be low on cholesterol and good for those with heart ailments.

The government however, is yet to restore cash compensatory support to exporters of castor oil. Exporters have been claiming that lack of CCS and the insistance on Agmark certification has been hurting exports. Meanwhile, there are reports that the 10 per cent cut on petroleum products, enforced by the government on industrial undertakings, is hurting exports. Production of various industrial chemicals, which form the raw materials for the dyestuff and agrochemical industries, have been affected by the new order.

## RECORD SHOW BY OIL

Oil India Ltd. (OIL) recorded its best performance in 1989-90. The company achieved its highest profit before tax in this period. Gross income during the year was Rs. 668 crores and profit before tax was Rs. 122 crores. Gross internal resources generated by the company during the year increased by three per cent to Rs. 220 crores. The shareholders' fund as on March 31, 1990 was Rs. 631 crores as against long-term loans of Rs. 220 crores giving a debt equity ratio of 1:2.96.

RESIST SALT
METANILIC ACID
FOR QUALITY & RELIABILITY CONTACT :
CUSH N PAK
ENTERPRISES
Manufacturers and Exporters
145/3, G.I.D.C. Estate Naroda, Ahmedabad - 382 330
Phones : (F) : 811113, 815438 (R) : 472458 Fax : 91-272- 813004

# Aluminium extrusions industry in for a boost

With the four lakh tonnes per annum aluminium plant of National Aluminium Co. (NALCO) going into production, the availability of aluminium in the country has increased considerably and the industries which were facing aluminium shortage are likely to get the metal as per their requirements. One such industry is the extrusion industry.

Extruded aluminium with its high durability, light weight and strength has found various applications in areas like building construction, transport, defence and several other fields. In view of this, aluminium extrusion will play a greater role in a developing country like India. At present, only 60,000 tonnes of aluminium extrusions are manufactured in India as against five lakh tonnes in countries like Japan.

At present, there are only five companies in the organised sector with a capacity of around 30,000 tonnes per annum. Four out of the five plants are yet to start commercial production. With the government emphasis to reduce the use of wood in as many areas as possible, the best alternative is aluminium. The extrusion industry has a wide choice to import its plant and machinery from the U.S., Japan and the U.K. The main raw material is commercial grade aluminium ingots which is manufactured by BALCO, NALCO, and HINDALCO and can also be imported as the same is under OGL.

According to a market survey conducted by Tata Economic Consultancy Services (TECS), the demand for aluminium extrusion by 1992 is estimated to be 93,000 tonnes. The demand is expected to reach 1.12 lakh tonnes by 1995. The Eighth Plan study group has also estimated more or less the same demand projections. The all-India financial institutions have recently carried out a study to evaluate potential demand. This study has also confirmed the demand projection estimated by TECS.

The extrusions industry has been growing at a rate of 10 per cent per annum and with the availability of additional metal with NALCO going into production, the growth is expected to be 15 per cent as some of the areas which were not explored so far will now be able to get the metal as per their requirements. In the past, the secondary extruders have suffered due to irregular and insufficient supply of raw materials. The present consumption of aluminium in the building sector in India is only six per cent as against 32 per cent in the developed countries. NALCO's plant is expected to produce five lakh tonnes of metal during the current year. India manufactures only 300 types of sections today as against 3,000 in the developed countries.

Progressive Aluminium, promoted b Mr. M. Rajendra Prasad, Mr. A. Seshagiri Rao and Progressive Construction Ltd., is a new entrant in the field. It i setting up a 6,250 tonnes per annu project for aluminium extruded produc at a cost of Rs. 8.86 crores at Kallaka village, Medak district in Andhra Pradesh. According to Mr. A. Seshagir Rao, executive director, the highl sophisticated plant will have fully automatic, high-speed extrusion facilitie The machinery for the plant will b imported from the U.S.A., U.K. an Japan. This is the fifth project being se up in the country with almost simila capacities. The company hopes to sta commercial production by Octobe 1990. For the first full year of production ending March, 1992, the turnove is expected to be Rs. 10 crores at 40 pe cent capacity.

## DRAWBACK RULE RELAXATION WELCOMED

The Federation of Indian Expo Organisation (FIEO) President, M Ramu S. Deora, has welcomed the issu of customs notification allowing exporters the payment of duty drawback o amounts of Rs. 10,000 and above. Earlier because of limitations under customs rules, no drawback was payable i it was less than 2 per cent of the f.o.b value.

SALICYLALDEHYDE / SALICYLICALDEHYDE
COUMARIN
is now manufactured in INDIA with
Latest Technology
**Standard Quality & at**
**Competitive Price**
For more details please Contact Manufacturer:
**ATLAS FINE CHEMICALS PVT. LTD.**
Sterling Society, Bhavani Nagar, Plot No. 17, Bldg. No. 5, Flat No. 15,
Marol Maroshi Road, Andheri (E), Bombay - 400 059.
**Phone: 630 0401 (9.00 to 11.00 a.m.)**

KHARBANDA

# RANKLY SPEAKING

**Dr. O.P. Kharbanda, Cost & Management Consultant,**
**510, Olympus, Altamount Road, Bombay 400 026**

# Process Technologies — An Efficiency Index

hemical process industry is one of the most dynamic
stries, with new processes and technologies being con-
tly developed. An objective comparison of various alter-
ve technologies for a particular product is extremely
icult because of numerous and complex factors involved,
more often than not it is highly subjective. Several
mpts have been directed to making this comparison objec-
, perhaps the most significant of these is the develop-
nt of TEI (B. Zaidman & G. Cevidalli: 'The Technology
iciency Index — A method for measuring process tech-
ogies', Technological Forecasting and Social Change, Vol.
No. 1, 51-62, 1989). The authors are both at the Casali
titute of Applied Chemistry, School of Applied Science
Technology, The Hebrew University of Jerusalem, Israel.
is index is based on objectively measurable factors such
stoichiometric ratio, maximum temperature and number
stages etc. which is either available or can be determined
case of a new process.

TEI is somewhat similar to the economist's 'production
nction' and is a function of input resources consumed in
production process. A dimensionless number, TEI takes
gnizance of the fact that a technology is considered effi-
ent if it utilises minimum resources, defined as the pri-
ary form of production factors before their translation into
onetary units. It is a function of coefficients that are pro-
ortional to one or more of the resources, notably raw mater-
als, capital, labour and energy. TEI is expressed as a function
f three relevant factors, thus:
EI = K/(EWMR) (CUC) (Fc), where EWMR (Ecological
veighted matter ratio) = (MW RM) / (MW Products) - (MW
vastes), CUC (Coefficient of capital utilisation) = N + (a)
n), where N is number of unit processes, n = number of unit
operations and a = subunitary multiplier. CUC also reflects
he degree of utilisation of direct and indirect labour, Fc, an
indicator of complexity of the process, dependent on 3
weighted F's expressing the operating conditions imposed by the technological concept (maximum temperature °C and maximum pressure atm and the enthalpy of reactions, Kcal/-mole):

$$Fc = 10^{(Ft + Fp + Fe)}$$

The constant K is arbitrarily given a value of 100, thus for an 'ideal' technology, TEI is 100, with value of EWMR as 1.0 (i.e. one unit of raw material is transformed to one unit of product), in one unit process (N = 1), without any unit operation (n = 0) at room temperature (Ft = 0), atmospheric pressure (Fp = 0) without application of any external energy (Fe = 0). Authors emphasise that there is no absolute meaning of thus representing TEI except for the convenience of the user. It is merely a tool for comparing various alternative process technologies for a specific product. And the proof of this is in the 'pudding'! This is demonstrated in case of phenol for which at least five well documented process technologies have been used over the years and for which the relevant information is available, for example, in the three editions (1947-1985) of the chemical 'Bible' Kirk-Othmer's Encyclopedia of Chemical Technology (Wiley). The five technologies, their year of introduction and TEI are:

| **Process** | **Year** | **TEI** |
|---|---|---|
| Benzene sulphonation, melt caustification & acidification | 1910 | 4.0 |
| Chlorobenzene hydrolysis followed by acidification | 1925 | 6.7 |
| Oxychlorination of benzene, then steam hydrolysis | 1935 | 24.2 |
| Peroxidation of cumene to yield phenol and acetone | 1955 | 22.9 |
| Oxidation of toluene followed by decarbonylation | 1960 | 33.5 |

The first two processes represent the first generation technologies with their very low TEI, and now practically extinct. The three subsequent technologies represent a quantum jump with a 4-5 fold increase in TEI. The last process is obviously most superior, but cumene process is a winner specially when there is an adequate market for the phenol byproduct. Several other examples are included, e.g. aniline, acrylonitrile in the original article, and it does appear that TEI concept may prove to be extremely useful and highly practical.

---

Dr. Kharbanda, a Fellow of the Institution of Chemical Engineers, is visting professor and author of repute. His recent tile: SAFETY IN CHEMICAL INDUSTRY, (Heinemann, 1988). Forthcoming tiles. (All with Mr E.A. Stallworthy) WASTE MANAGEMENT — TOWARDS A SUSTAINABLE SOCIETY (Gower,1989) & PROJECT TEAMS — THE HUMAN ELEMENT (Ntl. Computing Centre, 1990). Available from Vivek Enterprises, 5, S.K. Barodawalla Marg, Bombay 400 026.

MAZDA CHEMICALS

IF YOU NEED

SODA ASH LIGHT - HEAVY - MEDIUM
SODIUM BICARBONATE
BROMIDE - POTASSIUM & SODIUM
SODIUM TRIPOLYPHOSPHATE (STPP)
SODIUM SILICO FLUORIDE (SSF)
GLYCERINE (Refined - I.W.)
GELATINE 120 to 280 Bloom
NaHS (Sodium Sulpha Hydrate Sol. 30%)
ALPHA OLEFIN SULPHONATE (AOS)

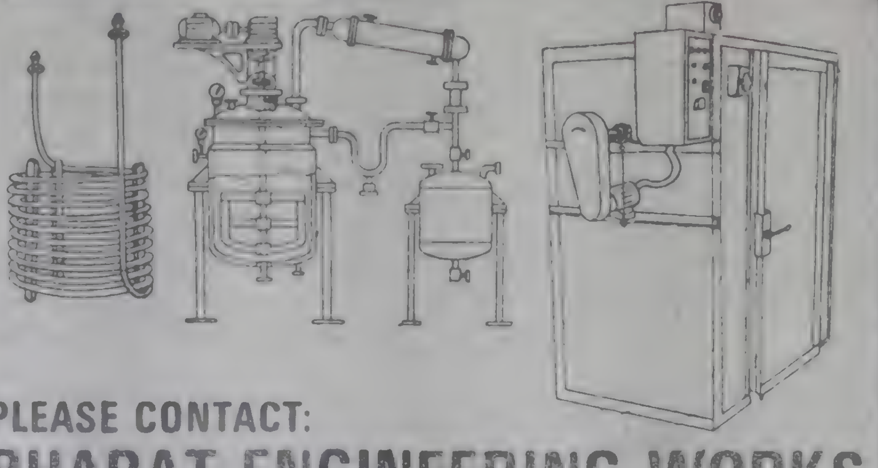
RING

225407, 225408, 234065, 244522, 244254, 244510

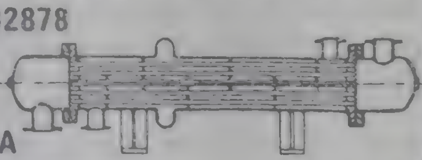
OR VISIT

MAZDA CHEMICALS
DISTRIBUTORS & SELLING AGENTS
Apeejay House, 130 Apollo Street, BOMBAY 400 023.

- REACTION VESSEL
- PRESSURE VESSEL
- VACCUM VESSEL
- HEAT EXCHANGER AND CONDENSER
- DISTILATION UNIT
- EVAPURATORS
- TRAY DRYERS
- STORAGE TANK
- HIGH SPEED STIRRERS AND
- GLASS LINED VESSEL



PLEASE CONTACT:
BHARAT ENGINEERING WORKS
FACTORY- OFFICE: PHONE: 6982878
B/4, BHAURAO UDYOG NAGAR
BALARAM PATIL MARG
BHAYANDAR (EAST) DIST. THANA



bharat

MANUFACTURERS OF CHEMICALS, PHARMACEUTICALS, FOOD, PAINT, FERTILISER, BREWERY AND ALLIED INDUSTRIES MACHINES

WE OFFER YOU BEST QUALITY & COMPETITIVE RATES
IN TANKER LOAD AND DRUM PACKING

**N-BUTANOL** **ACETIC ACID**
**ETHYL ACETATE** **BUTYL ACETATE**
**TOLUENE** **BENZENE**

**LAPE ALL GRADES**
*Authorised Dealers*
**M/s. OSWAL PETROCHEMICALS**
(A Unit of **OSWAL AGRO MILLS LTD.**)
Please Contact:

**SHREE VALLABH CHEMICAL CORPORATION**
349/353, Samuel Street, Indu Chambers, 4th Floor, Vadgadi, Bombay 400 003.
**Dial: 325623, 344219**
*Our Associates:* **KANTI TRADING CO.**, Bombay-3.

---

**PARAGON INTERNATIONAL**
Mfrs. of TIN SALTS as per IS 3026
TIN CHLORIDE * TIN OXIDE (Black & White)
TIN SULPHATE (Acid Tin Salt) * TIN STANNATE (Alkaline Tin Salt)

---

**POPATLAL JESHINGBHAI & CO.**
**Importers of**
LITHOPHONE RED SEAL 30% (Czechoslovakia)
POTASSIUM FERROCYANIDE (GDR) * RANGOLITE C (Czechoslovak
POLYETHYLENE WAX LE 253, HI WAX 4202E & WAX
for Plastic & Printing Inks. LE 114
MODVAT facility available for imported products
*Contact:*
Kabibai Trust Bldg., 14/16, Bhandari Street X Lane, Vadgadi, Bombay 400 003.
**Phone: 326844/341985; Resi: 486378**

---

FOR YOUR REGULAR REQUIREMENTS OF:

**MIXED XYLENE**
**(Ex - Kandla - Naked)**
**PHTHALIC ANHYDRIDE**
**DIACETONE**
**PHENOL**

Note: Excise Gate Pass will be given for MODVAT Benefit
Please Contact:

**BEEKAY ENTERPRISES**
503, Faiz-e-Qutbi, 375, Narsi Natha Street, Bombay 400 009.
**Phones: Office: 349080/345011/348475/322958; Resi: 5121572/5124452**
**Telex: 011-71707 BKE IN**

* ACTIVATED ALUMINA BALLS, GRANULES & POWDER
* MOLECULAR SIEVES TYPE 3A, 4A, 5A & 13X
* ACTIVATED CARBON GRANULAR & POWDER
* SILICA GEL WHITE & BLUE
* SILICA GEL FABRIC BAGS
* PRECIOUS METAL CATALYSTS & SALTS like Pd, Pt etc.

RASHMI DHABUWALA
(Authorised Signatory)

**R.V. CORPORATION**

9, Uttam Chambers, 39, Syed Mukri Street, Katha Bazar, Bombay 400 009.
Phones: 325440/341184 Resi.: 6366147 Gram: AMARJYOT, Bombay 400 009.

**RASHMI DHABUWALA has resigned as partner from M/s. Catalysts & Chemicals, Bombay 400 056.**

---

FOR YOUR REQUIREMENT OF

META CRESOL 40-42%
PURE META CRESOL 98%
PURE PARA CRESOL 98%
SODIUM SULPHITE 78-80% & 85%
ORTHO CRESOL 98%
ORTHO CRESOL 90%
RESORCINOL
METANILIC ACID
META TOLUIDINE

Manufactured by: **ATUL PRODUCTS LTD.**

PLEASE CONTACT DISTRIBUTORS/AUTHORISED AGENTS

**CRESCENT CHEMICALS**

Regd. Office: 404, Faiz-E-Qutbi, 375, Narsi Natha Street, Bombay 400 009.
Tel.: 342231/348096/348305 * Telex: 011-5412 CRES IN

Sales Office: 56-B, Sanjay Building, 5 Mittal Estate,
Andheri Kurla Road, Bombay 400 059.
Tel.: 6322697/6342320/6329110/6322136

---

AVAILABLE
EX-STOCK

**PROPYLENE GLYCOL - I.P.**

Please Contact:

**Ganesh Turnkey Projects & Lessors Ltd.**

C-20, Monarch, Shriniwas Bagarka Road, Andheri (E), Bombay - 400 059.
Phone: 298476

*Branches:* Delhi & Calcutta

## OTLIGHT ON

# Biotechnology & Life Science (Part 2)

### UPDATE ON BIOTECH-LOGY IN THE USSR

oviet biotechnology could offer stern firms unexpected opportunities cooperation, according to a recent rt (Biotechnology in the USSR, GB technology, Swansea, UK) compiled r a visit to the Soviet Union.

t is practically impossible to build a biotech plant in the Soviet Union ay. Public opinion has turned against technology in the USSR in the wake ome major ecological disasters. The me mainly was with the production single cell proteins (SCP), used to ke up protein deficiencies in a cattle d, according to the report. The public cry following the incidents of biotech lution in the vicinity of the SCP fac-ies has been such that part of the pro-amme has been shelved and the word otechnology been dropped from the nistry of Medical and Microbiolog-l Industry.

The USSR's research effort is now be redirected mostly towards medi-l uses. Soviet scientists have achieved nazing feats in this area, especially in e light of sometimes inadequate quipment. Even in this field though, fety practices are well below anything at would be required in the West. It ould certainly be a problem to get Vestern agencies to approve products hich have been tested in the USSR.

The report suggests that the EEC hould take Eastern Europe and the JSSR into account when it starts draw-ng up rules on biotechnology. For the resent, according to the Report, the JSSR just cannot afford Western standards in biotechnology.

Concerning the Wests superiority in biotechnology, the Report says: 'While technology gap in this area is significant the quality of basic science is such that given the present climate of perestroika, we can expect it to close over the next decade '. Most Soviet biotech institutes are eager to sell their services or products to the West for the hard currency needed to buy modern equipment.

Not all institutes lag behind their Western counterparts. The Shemyakin Institute of Bioorganic chemistry in Moscow is an outstanding institute by any standards. The Institute has just finished a $45 million pilot plant with an abundance of Western equipment, which can be compared to the best available in USA.

The Moscow Institute of Molecule Genetics (IMG), is another highly advanced establishment. The IMG has come out with lymphokine-based therapeutics against hepatitis-B, herpes viruses multiple sclerosis, hairy-cell leukemia, reveal carcinoma and malignant melanoma. Only a few of these treatments are available in the West.

The USSR biotech institute are to cooperate in the sequencing of the human genome. The programme is to concentrate on identifying those parts of human genetic make-up which may cause disease and birth defects. (*Chem. Ind.*, 2/5/90, p. 47).

### EUROPEAN CHEMICAL FIRMS APPEAL FOR A CLEAR SYSTEM FOR REGISTERING & PATENTING NEW BIOTECH PRODUCTS

Seven of Europe's biggest chemical firms called last February for the European Community to revolve its many current biotech policy initiatives into a clear system for registering and patenting new biotech products.

The firms — Britain's ICI and Unilever, Poulenc from within the Community, and Monsanto and Sandoz from outside it — also want a Community wide market for biotech products and market authorization based only on scientific criteria of quality, safety and efficacy. (*New Sc.*, 2/10/90, p. 27).

### AN UPDATE ON RECENT ADVANCES IN MICROBIAL PRODUCTION OF VITAMINS

An extensive literature has been published in journal and patent literature covering the use of microorganisms for the production of vitamins, especially those of the B-group, including biotin, folic acid, pantothenic acid, pyridoxine, riboflavin, thiamine and Vit $B_{12}$. However, only two vitamins of the B-complex group are commercially produced by microbial fermentation. The production of Vit $B_{12}$ by certain bacteria and the production of riboflavin by the ascomycete fungi *Eiemothecium ashbyii* and *Ashbya gossypii*.

Recently, much advance has been reported on the microbial production of riboflavin (Vit $B_{12}$) from *E. Ashbyii* and *A. gossypii* and production of carotenoids form fungi.

Riboflavin's present-day microbial production process based on *A. gossypii* competes commercially with the chemical synthesis process. The world-wide production of 1.25 million kg Vit $B_{12}$ is used to supplement human diet and animal feedstuffs. A number of bacteria and fungi can produce riboflavin but *E. ashyii* and *A. gossypii* are the most important since these fungi can synthesise up to 2.5 and 7.0 g/litre respectively in industrial fermentations. Hyperproducing mutants of *A. gossypii* used in industrial fermentation have internal concentrations of the flavin nucleotides similar to those in wild type strains but have much more intracellular riboflavin. Early researchers gen rated such flavinogenic strains with arious mutagens reported a correlation etween pigmentation and over-pro luction. Analysis of mutants has also ndicated a correlation between sporu ation and flavinogenesis. The best strains sporulated will and in one study, all mutants incapable of overproduc ing riboflavin did not sporulate at all, suggesting that common factors may play a role in regulating both processes.

Early studies employed sodium dithionate to eliminate low yielding mutants in selection experiments, recommend frequent re-isolation of flavinogenic strains and advised immediate preservation of useful strains to cope with instability inherent in riboflavin-producing mutants.

Extensive studies on fermentation processess have complemented genetic manipulation of *A. gossypii*. Production of flavinogenic mutants is enhanced by a number of compounds, among them purines and surface active agents.

## A NEW LOOP FERMENTER DEVELOPED TO PROVIDE HIGHER OXYGEN TRANSFER RATES

Pilot-scale testing of a novel 70-L loop fermenter began recently at Northeastern Univ. (Boston). Loop fermenters circulate the broth through an external pump circuit, often passing it through a heat exchanger for better control of heat transfer than standard stirred tank reactors.

Developed by Herzog-Hart Corp (Boston), the patented bioreactor combines nozzle jet mixing with the reintroduction of the circulating broth and sparged air. This combination provides improved bulk mixing and increased interfacial oxygen transfer — yielding higher cell concentrations.

Laboratory tests on Saccharomyces cerevesial production achieved cell concentration of 25 gm/lit vs 8.3 gm/lit, for a stirred-tank reactor at the same energy input. Researchers are now investigating the growth of other microbial cultures using this technology, as well as the optimization of flow distribution with the system. (*Chem Eng.*, 5/1990, p. 25).

## DEADLY PCB IN RIVER & PONDS TO BE ELIMINATED BY RAVENOUS BUGS

An experimental clean-up procedure proposed by General Electric Corporation's R & D Centre (USA) endeavours to remove deadly PCBs by employing anaerobic bacteria.

In this experimental method, GE scientists will pump nitrogen, phosphorus and other minerals into the floor of Woods Pond, Pittsfield MA, USA.

The nutrients will encourage anaerobic bacteria to strip chlorine atoms from PCB molecules embedded in pond sediment. This will allow aerobic bacteria, which thrive in the oxygenated water, to completely devour the remaining dechlorinted contaminants. The process will eliminate PCBs from the environment, not just move them somewhere else.

Studies have shown that PCBs once considered to be indestructible actually are decomposed naturally by anaerobic and aerobic bacteria feeding on floor sediment of waterways. Adding mineral nutrients can cut natural degradation time in half, GE researchers discovered.

In lab experiments, the GE researchers dechlorinated 90% of the PCBs in sediment samples within 4 months.

However, the anaerobic bacteria on the stagnant sediment of Woods Pond which contains PCBs in concentration between 100 and 200 ppm, currently are not breaking down any of the material. Therefore, GE will use six treatment cells equipped with motors to gently mix and expose floor sediment to different combinations of nutrients.

This process should activate anaerobic organisms and eliminate most of the contaminents confined in the cells within 6 months.

Once the experiments are completed, the GE researchers will begin testing their method in the Hudson River for PCB clean-up. (*R & D*, 1/1990, pp.19-20).

## THERAPEUTIC APPLICATIONS OF GROWTH FACTORS ON THE HORIZON

The preparation and isolation o growth factors in large quantities by r DNA technology have made it possible to develop new therapeutic applications for these polypeptides. Moreover the identification of growth factors i tumours via monoclonal antibodies ha helped in the diagnosis of certain cancers. For example, elevated erythropoe tin synthesis is a valuable biologica marker in detecting some renal cancers (*Urology* 28, 301-306 (1986).

Identification and reduction of th elevated levels of growth factors i tumours may be helpful in developin rational thereapeutic regimens. DN and RNA screening can be used t detect changes in the levels of growt factors and oncogenes in qualitative an quantitative assessments of tumour progression.

Many of the hemotoporetic growt factors have anti-tumour and immunosuppressive properties and to this en they may be useful in restoration o hematopoiesis after bone marrow transplantation, chemotherapy or radiotherapy.

Other potential applications o hematopoetic growth factors are suggeted by their ability, directly or ind rectly, to attract and active neutrophil eosinophils and macrophages in defen

nst infection. Production of large
tities of tumour inhibition proteins,
as interferons, interleukins and
our necrosis factors has allowed
trol and regression of some malig-
cies. New genetic engineering tech-
ues have made growth factors
essible for various research investi-
ions and clinical applications. They
e been found to be useful in a vari-
of contexts, ranging from wound
aling to cancer chemotherapy, AIDS,
aemia and infection.

Rigorous clinical trials and drug
aluation will identify more applica-
ons for these polypeptides as well as
nprove their efficiency and minimize
eir side effects. Basic research involv-
g growth factors should provide in
uture more detailed understanding
bout their structure and help in the
evelopment of new synthetic agonists
nd antagonists that display improved
harmacokinetics. (*Pharmaceutical
echnology*, 5/1990, p.34.).

## BACTERIA MAY HELP IN EXPLOITING LOW-GRADE COBALT ORES IN USA

Cobalt may be produced in USA for the first time since 1971 if a process under development at the Department of Energy's Idaho National Engineering Laboratory (INEL, Idaho Falls) proves practical. Domestic deposits of cobalt are too low-grade for economical production by conventional methods, so USA imports all its cobalt at present. However, researchers at EG & G Idaho, a prime contractor at INEL, have found a strain of *thiobacillus ferroxidans* bacteria that promises to extract cobalt economically. A 1% cobalt ore and the bacteria are put in a column and a nutrient solution is passed through. The bacteria use iron and sulfur in the ore as energy sources, releasing cobalt and other metals into the solution. In a second mechanism the bacteria convert ferrous iron ($Fe^{+2}$) to ferric iron ($Fe^{+3}$), which oxidizes the ore to release metals. So far, the recovery rate is too low for the method to be commercially viable. However, some improvement may be achieved by reducing the aluminium and magnesium content of the nutrient solution, as these metals precipitate onto the ore and impede the process. (*Chem Eng*., 5/1990, p. 23).

## GENETICALLY ENGINEERED CORN — A TALL ORDER FOR US AGRICULTURE IN THE 1990s

Whole new kinds of corn are coming up in 1990, atleast in the laboratory. Until this year, corn, the top seed market in USA had defied researchers attempting to introduce new genetic materials into its cells to generate new fertile plants. Now these programmes conducted by the USDA with Monsanto Agricultural, Dekalt Genetics (Dekalt, Ill.) and Bio Technica International (Cambridge MA) — have added genes to corn cells that produced fertile plants and passed the new traits on in viable seeds.

DeKalt and USDA/Monsanto has a technology, called a gun or bioblaster, developed by John Sanford at Cornell University. Du Pont has licensed the invention and is doing further development. The gun uses a 0.22 caliber cartridge as a impetus to fire particles coated with genetic material into cultured cells. It has proved to be easier and faster than the previous method, which uses an electrical field to open pores in the cells, allowing the genetic matter to be inserted. Biotechnica would not say what method it uses.

Expressing implanted genes in successive-plant generations is not new to agricultural biotechnology in direct plants like tobacco, potatoes, tomatoes and canola. Cereal monocots like corn and wheat have been problematic, because they have only a few germ cells in each plant, unlike dicots in which any cell can generate another plant. Cereal monocots, however, are the most important prize. The US seed corn market is worth $1.5 billion/year. Although the breakthroughs clear a major hurdle, farmers are 5-10 years from getting genetically engineered corn in their fields. "These discoveries just show that the problem is, in principle solvable" cautions Mary Dell Chilton, director of Ciba Geigy's agricultural research unit.

'A marker gene is easy. Insect or disease resistant genes will take a lot of study' reports Chilton. Last year Chilton's group was the first to report successful incorporation of a new gene into a corn plant, but it did not yield viable seeds. George Kidd, vice president of plant biotech consulting firm (L William Terveles, Milwaukee) expects it will take 'at least 3 years to find an added value feature that warrants biotech development,' one that cannot be introduced using lower cost classical breeding techniques. He foresees 'easily another 6 years until you can sell any seeds, and with a standard generation rate, another 3 years before you are on one-third of the fields'.

Bob Richard an authority at Dekalt reports the next step 'is defining which agronomically important traits we want to insert and seeing if they can be inserted. It is not just a matter of pulling the genes off the shelf and having seeds tomorrow'. He adds that the new seeds also will have to be competitively priced, despite the development expenses.

Researchers also point out to a severe shortage of identified genes to give the desired single-gene dominant traits. Further, someone will have to do a deep study on the corn genome similar to the one for the human genome. Another research group counter, however, that there are at least a half-dozen agronomical genes from dicots, including virus, herbicides and pest resistance that should work in monocots with little tinkering. Despite the latest advances, researchers still feel that biotech i the tool of last resort Gregor Mende still dominates commercial agriculture *Chem. Wk*., 5/23/90, p. 25)

AVAILABLE
INDIAN AND IMPORTED

**OIL LEMON**
4% Cital

**OIL BERGAMOT**

**GERANIUM OIL**

**OIL ORANGE**
4% Cital

**CARDAMUM OIL**
100% Pure & Natural Sweet
Double Distilled

**CARDAMUM EXTRACT**
100% Pure & Natural

*DEALERS ENQUIRIES SOLICITED*

* * *

**SYNTHETIC POLYESTER RESIN (35/210 KG)**

Grades
G.P. -- Car Patch
Choke -- Marble
F.R.P. -- Rooflite
Isophthalic Polyester Resin
Isophthalic Gel Coat
G.P. Gel Coal
(For Surface Finishing)

* * *

*Available Solvents*

**TOLUENE/BENZENE/XYLENE**
**HEXANE/I.P.A./ACETONE**
**M.E.K./DIACETONE/EDC**
**CYCLOHEXANONE/STYRENE**
**ETHYL ACETATE/CIX**
**TRICHLORO ETHYLENE**

**UNITED CHEMICALS**
WE MEAN BUSINESS

6, Shrinathji Sadan,
64, V.V. Chandan Street, Masjid,
BOMBAY 400 003.

Tel: 328795
Gram: SPEEDCHEM, Bombay 400 003.
Telex: 011-2846/011-2575/CTO-BY-IN
Attn: TD-132
Fax : 022-2024202, 022-2024001
Attn: AC-163

---

For Your Ready Requirements Of:

**POLYETHYLENE WAX OF LOW DENSITY**
**(HYDROCARBON WAX)**
**EMULSIFIABLE WAXES * PIGMENTS FOR PVC CABLE & PE CABLE**
**OTHER WAX * STEARIC ACID (ALL GRADES),**
**GLYCERINE CP/IW * PVC STABILIZERS**
**TBLS * DBLS * LEAD STEARATE**
**DBL PHOSPHATE * DBL PHTHALATE**
**CALCIUM STEARATE * ZINC STEARATE**
**OTHER METALLIC STEARATES**

SPECIALITY IN PVC CABLES, RIGID PIPE AND TEXTILE AUXILIARIES

Please Contact:
**Mr. PARIMAL MEHTA**
**ARPEE ENTERPRISES**
296/32, Samuel Street, 2nd Floor,
Bombay 400 003.
**Phones: 320136/328127**

---

**A TRUSTED & PROVEN NAME**
**TO MEET YOUR REQUIREMENTS OF**
**SEQUESTERING/CHELATING AGENTS**

# EDTA

**EDTA PURE ACID**
**EDTA DI SODIUM**
**EDTA TETRA SODIUM**
**EDTA TETRA SOLUTION**
**EDTA FERRIC SODIUM**
**EDTA FERRIC AMMONIUM**
**NTA**

Contact Manufacturers

*New Alliance Dye.Chem.Pvt.Ltd.*

**Office:**
C/o. P.V. Kamat & Co.
12, Khandelwal Bhavan,
166, Dr. D.N. Road, Bombay 400 001.
**Phone: 2040024**

**Factory:**
K-63, M.I.D.C. Tarapur,
Post-Boisar, Dt. Thane.
Pin: 401 506

For Your Requirements Of:

AMMONIUM MOLYBDATE (99.9% PURE) SODIUM MOLYBDATE (ASSAY 99%)

**CADMIUM** -- CHLORIDE/SULPHATE/CARBONATE/OXIDE/NITRATE
**BISMUTH** -- NITRATE/OXIDE/CITRATE/SUBCARBONATE/OXYCHLORIDE/SUBNITRATE
**COBALT** -- NITRATE/CARBONATE/ACETATE/CHLORIDE/SULPHATE/OXIDE/OXIDE BLACK
**NICKEL** -- CARBONATE/NITRATE/OXIDE/SULPHATE
**POTASSIUM** -- IODIDE/IODATE

**EDTA DI SODIUM SALT**

Contact Manufacturers

**MONARCH CHEMICAL INDUSTRIES**

Admn. Office: 25, Old Sattagali (Kaviniray Gali), Tarachand Ghanshyamdas Bldg.
1st Floor, Sheikh Memon Street, Bombay 400 002.
**Phones: Office: 318998/319814 Resi: 8129380/8127641**

---

Available Regularly Original and Distilled SOLVENTS
at most competitive price

**I.P.A./N. BUTANOL**
**ACETONE/DI ACETONE**
**BUTYL ACETATE**
**ETHYL ACETATE**
**OCTANOL/M.C.B.**
**ANILINE OIL**
**M.D.C./E.D.C.**
**T.C.E.**
**M.E.G./D.E.G.**
**XYLENE**
**TOLUENE/BENZENE**
**PHENOL**

Please Contact:

**GOODEARTH PETROCHEMICAL INDUSTRIES**
**TARUN PETROCHEMICAL**

*Sales Office:* 19, Bhandari Street, 10, Karimji Building, Bombay 400 003.
*Regd. Office:* 156/4, Chandrakiran, Sher-E-Punjab Colony, Mahakali Caves Road, Andheri (E), Bombay 400 093.
Phone: 345466, 322829; Resi: 6346603, 6321061

**WE ALSO PURCHASE WASTE SOLVENTS & PHENOL CRUDE MIXTURE**

---

AVAILABLE IN BULK & SMALL PACKING

**SULPHURIC ACID 98% & 70%**
**CHLOROSULPHONIC ACID**
**DILUTE NITRIC ACID 58%**
**ALUMINA SULPHATE**
**FERRIC/IRON FREE**

Please Contact:

**SDBB CHEMICALS (INDIA)**

*Head Office:*
Satnarayan House,
Section 17, Ulhasnagar 421 003
**Phones: 78238/75992/70096**

*Branch Office:*
Ganga Jamuna Cinema Bldg.,
Tardeo, Bombay 400 007
**Phones: 4922970/4944606**

Available from Ready Stock at Competitive Rates

ACETONE
AMYL ACETATE
ACETIC ACID GLACIAL
ANILINE OIL
ACID CRESOL PURE/TECH
BUTYL ALCOHOL N/ISO/TERT
BUTYL CELLOSOLVE
BUTYL ACETATE * BHT
CARBONTETRACHLORIDE
CARBITOL-ETHYL/BUTYL
CARBONDISULPHIDE

CHLOROFORM
CELLOSOLVE-
ETHYL/METHYL
CYCLOHEXANONE-NOL
CRESOL-TECH.
DIMETHYL FORMAMIDE
D.E.P./D.M.P.
D.B.P./D.O.P.
DIETHANOLAMINE
DIETHYLENE GLYCOL
DIMETHYLAMINE

ETHER PETROLEUM
40-60/60-80
ETHER SOLVENT
2-ETHYL HEXANOL
ETHYLENE DICHLORIDE
ETHYLENE GLYCOL
ETHYLENE DIAMINE
EPICHLOROHYDRINE
ETHYL CELLULOSE N-50
GLYCERINE (REFINED)/
I.W.

Please Contact:

MAKS CHEM INDUSTRIES

89, Princess Street, Pirbhoy Mansion, 2nd Floor, Bombay 400 002.
Phones: Office: 312358/257898/254363 Resi.: 8115229/8227223/6126969 Gram: "MAKSOL"
WE BUY CHEMICAL WASTE & DISTILLED SOLVENTS REGULARLY. WE REQUIRE CRUDE SOLVENTS LIKE IPA * CHLOROFORM * C.T.C. * TEA * METHANOL * ACETONE * PHENOL
Factory: Plot No. 1322, G.I.D.C., Opp. Hitech Capsule Factory, Sarigam, Dist. Valsad (Gujarat).

For Your Requirements of:

* ALPHA BLUE * RUBINE TONER
* LAKE RED C

and other PIGMENTS

Marketed by

M/s. DIPEE CHEMICALS PVT. LTD.

102, Sarvoday Commercial Centre, Salapas Road, Near G.P.O. Ahmedabad-380 001. Phone 23940

*Manufacturers:*

SAPPHIRE COLOURS

*Factory:* 3907, GIDC, Ankleshwar, (Dist. Broach)
*Office:* 729, GIDC, Ankleshwar (Gujarat State)

(KNS-ADI)

TO MEET YOUR REQUIREMENTS OF

- Monochloro Acetic Acid
- EDTA

Contact Manufacturers

SHREE KHODIYAR CHEMICALS

Behind Juvansinghji Hospital, Bhavnagar 364 001.
Phone: 29117, 29661, (R) 26708, 28523
Plant Plot No.: 202/203 Bhavnagar-Rajkot Road, Sihor.

# New Products

## ONTAMINATION ONITOR

Contamination level's of mineral oil hydraulic systems can be measured ickly and easily while the equipment still operating with a portable monr from Britain (UCC International d., System Monitoring Division), PO ox 3, Thetford, Norfolk, England 24, 3RT).

The CM 20, from UCC International claimed to be the world's first inline ontamination monitor. It is used in connction with the company's System 20 ensors, which are permanently installed nywhere within a fluid system. Once onnected to the sensor, the instrument akes a 10 ml. sample of oil, carries out he test and returns the sampel to the ystem without any danger of spillage or ingress of contamination.

The sample passes through the CM20 through a transparent slide system where any particles present have their area calculated and are counted by an optical scanning system. Every particle is viewed so that the result is a true measure of the content of the sample. During each four-minute test cycle, the microprocessor-controlled optical scanning system accurately measures the number of 5, 15, 25 and 50 um partcles per 100 mililitres. The result appears on a display, and a built-in 16 column printer can produce a permanent record, if requred. The internal memory stores up to 300 results for laser printout or downloading to a computer through an RS 232 interface.

Tests can be carried out inline with flow rates upto 400 litre/min and working pressures up to 400 bar. Accuracy and repeatability are claimed to be typically better than 5 per cent. The instrument is easy to use. All test operations are prompted by the display on the handheld readout unit. Power for up to 150 tests is provided by the built-in battery pack and power can also be drawn from an external 12 V D.C. source. Compact and rugged, the CM20 weighs 10 kg.

## MICROPOROUS TUBES HELP PURIFY WASTE WATER

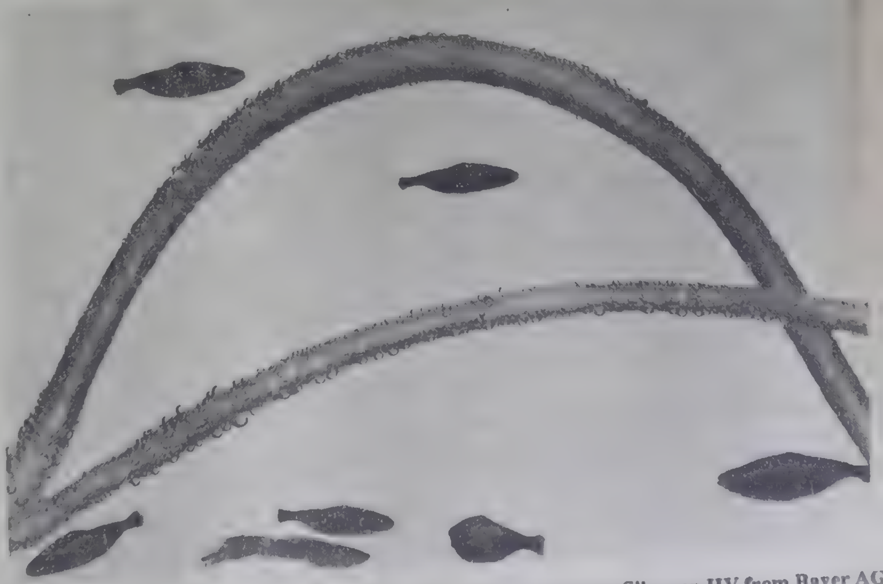
Thanks to its molecular microporosity, tubing made from Bayer AG's high temperature vulcanizing silicone rubber ®Silopren HV allows oxygen under pressure to diffuse through the tubing wall and into a surrounding medium. Accordingly, Silopren tubing made by insulating material manufacturer BIW Isolierstoffe GmbH, of Ennepetal, West Germany, is being used to aerate fermentation-type waste water treatment plant.

The small terminally sealed Silopren tubes are placed in the waste water and inflated with oxygen. The oxygen then diffuses continuously through the silicone rubber, entering the water and providing the bacteria with sufficient oxygen for their purifying activity. Being exceptionally resistant not only to oxygen, but also to ultra-violet radiation and ageing and weathering of all kinds, the extruded and elevated temperature vulcanized Silopren tubing is well suited to the rough and tumble of waste water treatment operations. An application for a patent covering the process for manufacture of a membranous tube with integrated supporting fabric has been filed by BIW Isolierstoffe GmbH.

Bayer supplies raw material for the finished products described above. For details, contact Jagat Chemicals Pvt. Ltd., Express Towers, Nariman Point, Bombay 400 021.

## ACID PICKLING INHIBITOR

New highly efficient corrosion inhibitor IC-233 has been developed by Chem-Cross for use in pickling baths of acids such as sulphuric, phosphoric, hydrochloric and sulphamic. IC-233



Tubes made from the high temperature vulcanizing silicone rubber Silopren HV from Bayer AG when added to pickling acids, efficiently removes mill scale, layers of oxides and rust without etching the metal.

A common deficiency in commercially available pickling bath inhibitors is the deposit of a resinous film on the surface of the metal which tends to colour the surface and interfere with subsequent cleaning and coating operations. Also many of the presently available inhibitors have very low solubility in the pickling baths. IC-233 is easy to handle, being liquid and soluble at room temperature. It leaves the cleaned surface free of any undesirable resinous film and ready for further operations such as plating, coating, galvanising etc.

For more details write to Chem-Cross, 4, Loop Lane, Race Course Road, Bangalore 560 009.

---

## CORROSION INHIBITORS FOR HEAT-EXCHANGERS AND RADIATORS

Water is used as heat exchanger media in heat-exchangrs and cooling systems of internal combustion engines. IC-255 is a unique corrosion inhibitor which improves upon presently available compositions which loose their effectiveness over a period of time in use.

IC-255 is a composition which renders heat exchange media substantially non-corrosive towards the metals and brazing alloys commonly used in heat exchange systems; it remains stable and effective for long periods of time and remains stable in long storage periods.

For further details contact Chem-Cross at the address given above.

---

## TEFLON BOND-AID ETCHANT

Bonding of Teflon to other substances such as metal, plastic, glass, ceramics, textile, wood, rubber etc., is necessary in some applications of Teflon. In order to be able to apply epoxy and other adhesives for effective joining operations, Teflon needs to be etched chemically to create anchor points.

Chem-Cross have developed "TF-76 Teflon etching composition". Its function is to modify the surface of fluorocarbon polymers so that adhesives can be used. All types of fluorocarbon polymers such as Teflon, Fluon, Halon, Kynar etc. can be etched. TF-76 is easy to use and can be adopted to spot, batch or continuous operation. TF-76 also makes Teflon surface paintable for marking or coding.

For more details write to Chem-Cross at the address given above.

---

## OLEUM SULF(O)NATION PLANT

Chemithon Engineers Pvt. Ltd. (CEPL), a joint venture with Chemithon Corporation (U.S.A.) offers a leading edge in technology through the state of the art continuous sulf(o)nation plants for detergent and industrial alkylates based on oleum/sulphuric acid and sulphur trioxide.

CEPL's continuous oleum sulf(o)nation plants can sulfonate linear/branched alkyl benzene. Primary/fatty alcohols, aromatics like xylene, toluene, cumene and non-ionics. The plants can be offered for Tandem sulf(o)nation of alkylates with continuous neutralization systems and electronic instrumentation. CEPL's plants can be operated with one man per shift and can run for 8000 hrs per year. Modular plants of 100/250/500 kg/hr are available at short notice.

CEPL's oleum sulf(o)nation process accomplishes in a minute what in batch type units require 6 to 10 hours. With this short residence time, a notable improvement in colour and yield is gained, resulting in better economic

Chemithon plants are used worldwid by leading companies like Procte Gamble, Colgate-Palmolive, Exxo Chemical, Shell Oil Companies etc.

For further details contact: Chem thon Engineers (P) Ltd., 317, Maker 221, Nariman Point, Bombay 400 02

---

## DU PONT ELASTOMERS

Du Pont, USA, offers a wide rang of advanced polymers for industri application and specialty wire and cab products. Some of them are:

**Hypalon® Chloro Sulforated Pol** ethylene Rubber is used for high qua ity mining, ship wiring and locomoti cables. It is also formulated to produ high quality offshore cables, low fi hazard cable jackets. Industrial applic tions are roofing, pond lining, can lining, automotive applications an industrial moulding.

**Nordel® EPDM Rubber** is uniqu in electrical and high heat ageing pro erties and is used in high voltage cab insulations. Other applications are roo ing, weather strip hoses, engine mount gaskets, automotive products and indu strial tyres and side walls.

**Neoprene** is a classic product that formulated for wire and cable applica tion, adhesive sealants, gaskets, bridg bearing pads, V-belts, hoses etc.

**Viton® Fluoroelastomer** is use almost in all military, defence and ae ospace applications. It is also used offshore drilling, automotive, industri application where heat and chemic resistance are of utmost importanc Viton® can withstand a service tempe ature of 250°C plus. Viton® is uniqu in its application as o-rings, gasket seals, fuel hoses and flue duct expar sion joints.

**Vamac Ethylene Methyl Acrylate**

ed for application where fire corrosion resistance, anti- ng, oil and heat resistance are the end-use properties. It is widely n zero halogen cables and auto- e parts.

trel® is a thermoplastic elastomer ombines the properties of plastics ibber. It is tough, abrasion and tear ant, low cut through good oil resis- and flame retardant.

can be processed on conventional noplastic extruders and processed y without additional compounding. or applications: tinsel cords, off- e drilling cable jackets, heavy duty es, flexible cords and engineering s and hoses.

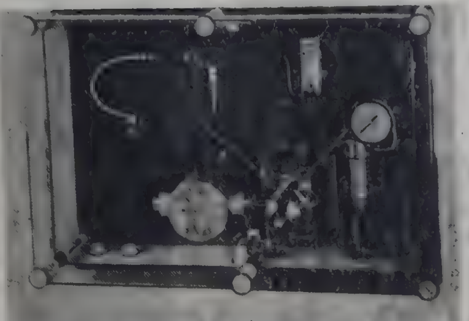
urther information can be had from Du Pont's Indian distributors: M/s. mrajka Impex Pvt. Ltd., 708, Maker ambers No. V, Nariman Point, nbay 400 021.

---

## WO NEW INSTRUMENTS OR THE NATURAL GAS DUSTRY

A major application for Shaw Mois- re Meters instruments is to measure e water vapour content of natural gas vital, because excess moisture would mage the compressors used to pro- ice the high pressure needed for dis- ibution. Such measurements are often omplicated by glycol contamination nd the presence of methanol. In addi- on, such instruments must be certified s safe to use with potentially explosive as. Shaw have now introduced two nits specifically designed to overcome hese problems.

**The new Shaw Model SDA-EXD** (Fig. 1) is rated explosion-proof EEx d IIB T6 using the CENELEC European standard. It houses the Shaw Model SDA dewpoint alarm, which gives direct analogue ead-out in dewpoint temperature and parts per million, with



tivity of up to 1 ppb (parts per billion). Also included is a shunt-diode zener barrier, and the Model SDA's explosion-proof rating means that it can be classed as a 'local safe area'.

**The new Shaw Model SWM-SSNGH sampling system** was developed for use with Model SDA-EDX to provide a sample conditioning and monitoring system (Fig. 2). It includes two-stage pressure reduction, with a heated first-stage regulator, having NEMA 7 termination and capable of accepting a sample at up to 300 bar. The heater, available for 110 or 240 V a.c. power supply and rated at 90 watts, maintains the temperature of the vital pressure reduction stages at a level sufficient to prevent hydrocarbons condensate or hydrate formation. The Shaw system deals equaly well with any glycol content in the sample.

A coalescing filter with drain (between the two pressure-reduction stage) plus a 0.6 micron filter after the final stage but upstream of the sensor remove any condensate present in the sample as it enters the system. Thus the sensor operates in a clean, condensate

mum response time, and ensuring long sensor life. The heated regulator also permits the sample system to be used with liquid hydrocarbon samples i.e., the heat vaporises the sample, which ensures simple, reliable and economical operation. Methanol vapour has no effect on the Shaw sensor because its performance is related specifically to water vapour.

Further information can be had from Shaw Moisture Meters, Rawson Road, Westgate, Bradford, England BD1 3SO.

---

## OLEUM BASED CONTNUOUS LABS MANUFACTURING PLANTS

M/s. Amobha Technologies offer plants for continuous sulphonation of LAB, DDB using oleum 20%. The plants can be offered in capacities ranging from 100 kgs/hr to 10,000 kgs/hr on finished product basis.

The plants are based on the Dominant Bath technologies and produce LABS/DDBS with very low residual free oil and mineral acidity. The colour of the resultant detergent products is very light. The plants also have 'instant-start-instant-stop' characteristics so that sudden power outage does not lead to off-spec product. Being fully automatic, the plant regardless of its capacity can be operated by only one operator per shift.

These plants are ideal for synthetic detergents manufacturers who wish to produce their own acid slurry so as to eliminate the problems of quality, AM variation, colour etc. of bought out material. Amobha technologies also offer plants for other detergent additives such as SLS, SLES, cocodiamines, as well as modified plants for sulphonation of benzene, nitrobenzene, toluene, xylene, polyalkylbenzene etc.

For further information, contact Dr. Mohan N. Bhawe, M/s. Amobha Technologies, 41, Manali Apartments, Han X road, Vile Parle, Bombay-57.

ATTENTION! ACTUAL USERS!

**SULPHURIC ACID in Tanker Load**
**SULPHAMETHOXAZOLE I.P./B.P./U.S.P. Grade**
**MANGANESE ACETATE Tech. & L.R. Grade**
**AMMONIUM PHOSPHATE Mono & Di Basic L.R.**
**AMMONIUM OXALATE L.R.**
**SODIUM OXALATE L.R. * OXALIC ACID L.R.**
**CITRIC ACID * H. ACID * R. SALT**

Please Contact:

**CHEMI UDYOG**

195, Dr. Cawasji Hormosji Street, Shree Ram Bldg., 2nd Floor, Bombay 400 002.
**Phones: 295286, 314542 Resi: 693066**

For Your Requirements Of:

**Ammonium Bifluoride, Barium Fluoride, Calcium Fluoride (Pure), Copper Fluobrate, Fluoboric Acid, Lead Fluoborate, Magnesium Fluoride, Nickel Fluoride, Potassium Fluoride, Potassium Bifluoride, Potassium Fluoborate, Potassium Titanium Fluoride, Potassium-Zirconium Fluoride, Sodium Fluoride, Sodium Cryolite, Sodium Bifluoride, Sodium Fluoborate, Sodium Silico Fluoride, Tin Fluoborate, Tin Sulphate, Tin Chloride, Lithium Bromide Powder, Lithium Bromide Solution, Lithium Chloride Powder, Lithium Chloride Solution, Lithium Fluoride and other Fluorine Chemicals.**

Please Contact:

**M/s. SHREE JALARAM CHEMICALS**
5, Kesar Chawl, Balrajeshwar Road,
Next to Fabina Mills,
Mulund (West),
BOMBAY - 400 080.
**Gram: THREESTAR, Bombay-400 080**

**M/s. SHREENIVAS CHEMICAL INDUSTRIES**
C-3/102, Veena Nagar,
L.B.S. Marg,
Mulund (West),
BOMBAY - 400 080.
**Phone: 561 81 26 Off./Resi.**

**AVAILABLE EX-STOCK WITH MODVAT BENEFITS**

PROPYLENE GLYCOL USP -- DOW/ARCO
AEROSIL 200 NF
POLYVINYL PYRROLIDONE
  P.V.P.-K 30/KOLLIDONE 30 USP
ETHYL CELLULOSE NF "ETHOCEL"
  GRADES: N-7, N-10, N-20/22, N-45/50, N200
MICROCRYSTALLINE CELLULOSE NF/USP "AVICEL"
  GRADES: AVICEL PH 101, AVICEL PH 102, RC 581/591
BUTYLATED HYDROXY ANISOLE (B.H.A.)
TERTIARY BUTYL HYDROQUINONE (T.B.H.Q.)
METHYL / PROPYL PARABEN
ETHYL / BUTYL ACETATE
I.P.A.
CARNAUBA WAX / CANDELILA WAX
VANILLIN

TITANIUM DIOXIDE ANATASE / PHARMA U.S.P.
HYDROXY PROPYL METHYL CELLULOSE (H.P.M.C.)
  USP - 2910
  METHOCEL E3, E5, E15, E50, K4M, E4M, K100, K15M
  PHARMACOAT 603, 606, 615
CELLULOSE ACETATE PHTHALATE USP (CAP)
LACTIC ACID 88-92% U.S.P.
HYDROXY ETHYL CELLULOSE "NATRASOL" LR/GR
SODIUM STARCH GLYCOLATE "PRIMOJEL"
MAGNESIUM ALUMINIUM SILICATE NF "VEE GUM /
  VEE GUM HV / VEE GUM F"
CARBOMER / CARBOPOL 934, 940
POLYSORBATE "TWEEN 20, 40, 60, 80"
HPMC -- COLOUR LAKE READY MIX FOR TABLET COATING IN AQUEOUS/NON-AQUEOUS BASE "LUMI-NO-DIS"

***CHEMICIRCLE PHARMACEUTICALS***

Shree Krishna Niwas, Room No. 51, Corner of B. Master Road, Kalbadevi, Bombay 400 002.
Phone: 318583, 313251; Resi: 481595; Tlx: 011-76777; Fax: 287 2134

# Indian Standards

**(Continued from the previous issue)**

7647:1975 Acetoacet-2-toluidide (under review).

7661:1975 4-Aminoazobenzene (under review).

7686:1975 3-(N,N-diethyl) aminophenol (with Amendment No. 1).

7696:1975 Para cresyl methyl ether.

7697:1975 Phenyl ethyl methyl ether.

7704:1975 4-Aminotoluene-3-sulphonic acid, technical.

7729:1975 Sodium monochloroacetate.

7863:1975 Fertilizers, physical mixtures.

7886:1975 Barium chromate for explosive and pyrotechnic industry.

7901:1975 Triethanolamine, technical.

7905:1975 Calcium alginate, food grade.

7908:1975 Sulphur dioxide, food grade.

7910:1975 Monoethanolamine.

7911:1975 Diethanolamine.

7918:1975 Diethylene glycol (with Amendment No. 1, Dec. 1989).

7928:1975 Alginic acid, food grade.

7944:1976 Quintozene dusting powders.

7945:1976 Trichlorofone, technical.

7946:1976 Toxaphene emulsifiable concentrates (with Amendment Nos. 1, 2 and 3).

7947:1976 Toxaphene dusting powders.

7948:1987 Fenthion emulsifiable concentrates (first revision) (with Amendment No. 1 and 2).

7949:1976 Quintozene water dispersible powder concentrates (with Amendment No. 1).

S 7950:1976 Fenthion, technical (first revision).

S 7976:1976 Phorate, technical (with Amendment No. 1).

S 7977:1976 Disulfoton, technical.

S 7985:1976 Quintozene, technical.

S 8024:1976 Formothion, technical solution (with Amendment No. 1).

S 8025:1983 Monocrotophos technical (first revision).

S 8026:1987 Formothion emulsifiable concentrates (first revision).

S 8027:1976 Propanil emulsifiable concentrate.

S 8028:1987 Quinalphos emulsifiable concentrate (first revision).

S 8029:1985 Quinalphos dusting powders (first revision) (with Amendment No. 1).

S 8050:1976 Alpha picoline (Amendment No. 1, Feb. 1989).

S 8058:1976 Pyridine (Amendment No. 1 Feb. 1989).

S 8059:1976 2-Chloro-5-aminotoluene-4-sulphonic acid.

S 8063:1976 Red lead for explosive and pyrotechnic industry.

S 8071:1976 Propanil, technical.

S 8072:1984 Quinalphos, technical (first revision) (with Amendment No. 1 and 2).

IS 8074:1983 Monocrotophos SL (first revision) (with Amendment No. 1, 2 and 3).

IS 8111:1986 N,N-dimethylaniline (first revision).

IS 8120:1976 Schaeffer's acid (sodium salt), technical (first revision).

IS 8190:1981 Requirement for packing of pesticides: Part 1 to Part 4).

IS 8193:1976 2-Nitro chlorobenzene.

IS 8194:1976 3-Nitro chlorobenzene.

IS 8195:1976 4-Nitro chlorobenzene.

IS 8196:1976 2,4-Dinitrotoluene.

IS 8232:1976 2,6-Diaminoanthraquinone (with Amendment No. 1, 1986).

IS 8233:1987 Phenyl peri acid, technical (first revision).

IS 8249:1976 Zinc sulphate, agricultural grade (with Amendment No. 1 & 2).

IS 8258:1976 Oxydemeton-methyl technical concentrates (with Amendment No. 1 and 2).

IS 8259:1976 Oxydemeton-methyl emulsifiable concentrates (with Amendment No. 1).

IS 8267:1976 Dalapon-sodium, technical (with Amendment No. 1).

IS 8278:1976 Diphenylamine, technical.

IS 8281:1976 Hydroxylamine sulphate, photographic grade.

IS 8286:1976 Dalapon-sodium, water soluble powder.

IS 8291:1976 Phenthoate emulsifiable concentrates (with Amendment No. 1).

IS 8293:1976 Phenthoate, technical (with Amendment No. 1).

IS 8294:1986 Liquid amine salts of MCPA.

IS 8325:1983 Nickel formate for nickel catalyst (first revision).

IS 8356:1977 Titanium dioxide, food grade.

IS 8359:1977 Urea ammonium phosphate based fertilizer.

IS 8361:1977 Palm olein (Amendment No. 1 of 1977).

IS 8366:1977 Activated carbons, powdered.

IS 8388:1977 Code of safety for nitrobenzene.

IS 8397:1976 2-Nitrotoluene.

IS 8398:1976 3-Nitrotoluene.

IS 8399:1976 1, 3-Dinitrobenzene.

IS 8400:1976 2, 4-Dinitro chlorobenzene.

IS 8401:1977 Alkyl benzene sulphonic acid (acid slurry) (Amendment No. 1 of 1988).

IS 8445:1977 Carbendazim, (MBC) technical (with Amendment No. 1, 2 and 3)

IS 8446:1977 Carbendazim, (MBC) water dispersible powder concentrates (with Amendment 1, 2, 3 and 4).

IS 8483:1989 Dibenzothiazyl disulphide (first revision).

IS 8487:1977 Phosalone emulsifiable concentrates (with Amendment No. 1, 2 and 3).

IS 8488:1977 Phosalone, technical (with Amndt. No. 1,2&3).

8489:1977 Phosalone dusting powders (with Amendment No. 1).
8494:1977 MCPA, technical.
8496:1977 Propoxur, technical (with Amendment No. 1, 2, 3, 4 and 5).
8497:1982 Paraquat dichloride water soluble concentrates (first revision).
8498:1977 Temephos emulsifiable concentrates (with Amendment No. 1 and 2).
8502:1977 Specification for petroleum coke (with Amendment No. 1).
S 8551:1977 1-(4'-Sulphophenyl)-3-methyl-5-pyrazolone.
S 8552:1977 1-(4'-Sulphophenyl)-3-carboxy-5-pyrazolone (with Amendment No. 1, 1986)..
S 8553:1977 1-Phenyl-3-methyl-5-pyrazolone.
S 8587:1977 Fluorspar for chemical industry.
S 8626:1987 R-Salt, technical (first revision).
S 8627:1986 Gamma acid (first revision).
S 8628:1987 G-Salt (dipotassium salt), technical (first revision).
IS 8634:1987 Nitrodiazo acid (first revision).
IS 8635:1977 Limits for gaseous emission from sulphuric acid and phosphatic fertilizer industries (Amendment No. 1).
IS 8636:1983 Limits for gaseous emission from petroleum refineries (first revision).
IS 8637:1986 H-Acid (first revision).
IS 8701:1978 Temephos, technical.
IS 8702:1978 Diuron, technical (with Amendment No. 1&2).
IS 8703:1978 Diuron water dispersible powder concentrates (with Amendment No. 1).
IS 8707:1978 Mancozeb, technical (with Amendment No. 1).
IS 8708:1978 Mancozeb water dispersible powder concentrates (with Amendment No. 1).
IS 8766:1978 Driers for paints.
IS 8767:1978 Calcium carbonate, precipitated and activated for paints (Amendment No. 1, November 1987).
IS 8796:1977 Trimethylamine, technical.
IS 8813:1978 Potassium silicate, technical.
IS 8851:1978 Sulphur for rubber industry.
IS 8861:1978 1,4-Dichloro-2-nitrobenzene.
IS 8862:1978 Titanium dioxide (anatase type) for rubber industry.
IS 8873:1977 Monomethylamine, technical.
IS 8874:1977 Dimethylamine, technical.
IS 8877:1987 Acetoacetic methyl ester (first revision).
IS 8878:1978 Bromamine acid, technical.
IS 8883(Part 1):1978 Methods of sampling chemicals and chemical products: Part 1 to Part 2.
IS 8893:1978 1-(3-Chlorophenol)-3-methyl-5-pyrazolone.
IS 8904:1978 Anthrarufin.
IS 8944:1978 Chlorpyrifos emulsifiable concentrates (with Amendment No. 1).
IS 8954:1978 Edifenphos technical (with Amendment No. 1).
IS 8955:1978 Edifenphos emulsifiable concentrates (with Amendment No. 1).
IS 8956:1978 Nitrofen, technical (with Amendment No. 1).
IS 8957:1978 Nitrofen emulsifiable concentrates (with Amendment No. 1).
IS 8958:1978 Fluchloralin, technical concentrates.
IS 8959:1978 Fluchloralin emulsifiable concentrates (with Amendment No. 1).
IS 8961:1978 Chlormequat chloride, technical.
IS 8962:1978 Chlormequat chloride, aqueous solution.
IS 8963:1978 Chlorpyrifos, technical (with Amendment No. 1 and 2).
IS 8979:1986 Tetramethyl thiuram disulphide (first revision).
IS 9005:1988 Limits for gaseous emission from nitric acid and nitrogenous fertilizer industries.
IS 9024:1978 Granulated fertilizer mixtures.
IS 9052:1979 Code of safety for aluminium chloride, anhydrous.
IS 9053:1978 Code of safety for m-dinitrobenzene.
IS 9157:1979 Sodium nitrate and potassium nitrate for glass compositions.
IS 9189:1979 Method for determination for free chlorine in chlorinated organic compounds (colorimetric).
IS 9190:1979 Method for determination of acidity and alkalinity in halogenated organic solvents and their admixture
IS 9207:1979 Di-tert-butyl-paracresol, technical (with Amendment No. 1 ).
IS 9250:1979 p-Nitrophenol.
IS 9257:1979 Oil of Eucalyptus citriodora.
IS 9270:1979 1,4-Diethoxy benzene.
IS 9274:1979 Beta-chloroethylamine hydrochloride solution
IS 9277:1979 Code of safety for monochlorobenzene.
IS 9278:1979 Code of safety for zinc phosphide.
IS 9279:1979 Code of safety for aluminium phosphid (Amendment No. 1, Dec. 1981).
IS 9288:1979 Cyanuric chloride.
IS 9341:1979 Sulphamic acid for electroplating.
IS 9342:1987 Sodium hypophosphite for electroless platin (first revision).
IS 9343:1979 1-Phenyl-3-pyrazolidone, photographic grad
IS 9351:1980 Nickel chloride, hexahydrate, pesticidal grad
IS 9352:1980 Sodium cyanide, pesticidal grade.
IS 9353:1980 Alachlor, technical (with Amendment No. 1
IS 9354:1980 Alachlor emulsifiable concentrates (wi Amendment No. 1).
IS 9355:1980 Butachlor, technical (with Amndt. No. 1 and 2
IS 9356:1980 Butachlor emulsifiable concentrates (wi Amendment No. 1 and 2).
IS 9357:1980 Triallate, technical.
IS 9358:1980 Triallate emulsifiable concentrates (wi Amendment No. 1).
IS 9359:1980 Phorate granules, encapsulated (with Amendment No. 1 and 2).
IS 9360:1980 Carbofuran granules encapsulated (w Amendment No. 1 and 2).

9361:1980 Alachlor granules (with Amendment No. 1).
9362:1980 Butachlor granules (with Amendment No. 1 nd 2).
9363:1980 Fenthion granules (with Amendment No. 1).
9364:1980 Trichlorofon granules (with Amendment No. 1).
9365:1980 Fenitrothion granules (with Amendment No. 1).
9366:1987 Quinalphos granules (first revision) (with Amendment No. 1).
9367:1980 Disulfoton granules encapsulated (with Amendment No. 1 and 2).
9368:1980 Carbaryl granules (with Amendment No. 1).
9369:1980 Diazinon granules (with Amendment No. 1&2).
9370:1980 Lindane granules (with Amendment No. 1&2).
9371:1980 Aldicarb granules encapsulated (with Amendment 1, 2 and 3).
9372:1980 Methyl parathion, technical concentrates (with Amendment No. 1).
9406:1980 Calcium silicate for rubber industry.
9407:1980 Light magnesium oxide for rubber industry.
9424:1979 Sodium metasilicate.
9466:1980 Vicosity classification of industrial liquid lubricants.
9497:1980 Method for determination of sodium and potassium (flame photometric).
S 9504:1980 L(+)-Tartaric acid, food grade.
S 9505:1980 Monosodium L-glutamate, food grade (with Amendment No. 1).
S 9506:1980 Method for determination of sulphate (volumetric) (Amendment No. 1).
S 9572:1980 Benzyl butyl phthalate plasticizer.
S 9592:1980 Aluminium trifluoride for use in aluminium industry (first revision).
IS 9598:1980 Microcrystalline cellulose powder (Amendment No. 2, July 1988).
IS 9601:1980 Sodium silicate for cosmetic industry.
IS 9656:1980 Tridemorph emulsifiable concentrates (with Amendment No. 1).
IS 9665:1981 Propoxur emulsifiable concentrates (with Amendment No. 1 and 2).
IS 9667:1980 Tridemorph, technical.
IS 9681:1980 Stearic acid for cosmetic industry.
IS 9700:1981 Activated alumina.
IS 9744:1981 Code of safety for thionyl chloride (Amendment No. 1, December 1981).
IS 9786:1981 Code of safety for vinyl chloride monomer (VCM).
IS 9787:1981 Code of safety for phosphoryl chloride.
IS 9788:1981 Titanium dioxide, rutile for paints.
IS 9830:1988 Water soluble sodium carboxymethyl cellulose for cosmetic industry.
IS 9831:1987 Sodium hydroxide for cosmetic industry (First revision).
IS 9834:1981 Iso-Butyl alcohol.
Guide for treatment and disposal of effluents of fertilizer industry.
IS 9850:1981 Methyl iso-butyl ketone.
IS 9851:1981 iso-Propyl ether.
IS 9908:1981 Formic acid (with Amendment No. 1, March 1985) (under review).
IS 9909:1981 Succinic acid for electroless plating.
IS 9953:1981 Glyceryl monostearate, food grade.
IS 9970:1981 Dicalcium phosphate, food grade.
IS 9971:1981 Lactic acid, food grade.
IS 9985:1981 Sodium alkyl benzene sulphonate, technical.
IS 9986:1981 Benzaldehyde, technical (under review).
IS 10044:1981 Guide for treatment and disposal of effluents of petroleum refinery industry.
IS 10115:1982 Phosphorus pentasulphide (Amendment No.1).
IS 10116:1982 Boric acid (Amendment No. 1).
IS 10119:1982 Ready-to-use insecticides for spot application (with amendment No. 1).
IS 10125:1982 Copper carbonate.
IS 10243:1982 2,4-D Ethyl ester emulsifiable concentrates (with Amendment No. 1).
IS 10244:1982 2,4-D Ethyl ester water dispersible powders (with Amendment No. 1).
IS 10246:1982 N-N Diethyl-p-phenylene diamine sulphate, photographic grade.
IS 10265:1982 Endosulfan granules (with Amendment No. 1).
IS 10266:1982 Nitrofan granules.
IS 10267:1982 Phenthoate granules.
IS 10268:1982 Chlorfenviphos, technical.
IS 10271:1982 Anhydrous hydrogen fluoride, technical.
IS 10283:1982 Ethyl acetate for cosmetic industry.
IS 10294:1982 Paraquat dimethyl sulphate water soluble concentrate.
IS 10295:1982 Fenitrothion water dispersible powders (with Amendment No. 1).
IS 10296:1982 Captafol water dispersible powders (with Amendment No. 1).
IS 10300:1982 Captafol technical.
IS 10301:1982 iso-Propyl alcohol for cosmetic industry.
IS 10319:1982 Ethion emulsifiable concentrate (with Amendment No. 1).
IS 10332:1982 Hydrofluoric acid, aqueous.
IS 10355:1982 Copper aceto-arsenite.
IS 10369:1982 Ethion technical.
IS 10377:1982 p-Phenylenediamine.
IS 10438:1983 Potassium sulphite solution, photographic grade (Amendment No. 1 of 1987).
IS 10457:1983 N-methyl J-acid (with Amendment No. 1).
IS 10458:1983 Di-J-acid.
IS 10468:1983 1, 3-Phenylenediamine-4-sulphonic acid.
IS 10475:1983 J-acid urea.
IS 10502:1983 Guar gum, food grade.
IS 10508:1983 Phosphoric acid, food grade.
IS 10513:1983 Sodium oleo stearate, technical (soap noodles).
IS 10535:1983 Manganese sulphate, monohydrate

S 10583:1983 Sodium alginate for textile industry (with Amendment No. 1).
IS 10597:1983 Soluble starch phosphate (edible grade).
IS 10629:1983 Methods for determination of aldicarb residues in crops, soil and water (with Amendment No. 1).
IS 10630:1983 Methods for determination of methyl parathion residues in foods.
IS 10668:1983 Sodium formaldehyde bisulphite, anhydrous, photographic grade.
IS 10744:1983 Resorcinol.
IS 10745:1983 Acetophenone.
IS 10870:1984 Code of safety for hexane.
IS 10871:1984 Code of safety for hydrazine and hydrazine hydrate.
IS 10872:1984 Code of safety for malathion.
IS 10895:1984 Copper nitrate.
IS 10896:1984 Aluminium hydroxide, technical.
IS 10897:1984 Zinc phosphate pigment for paints.
IS 10904:1984 Sodium fluoride, technical.
IS 10920:1984 Code of safety for phosphorous trichloride.
IS 10931:1984 Lauric acid.
IS 10932:1984 **Palmitic acid.**
IS 10933:1984 **Myristic acid.**
IS 10977:1984 **Pentaerythritol** for explosive industry.
IS 11007:1984 Methabenzthiazuron technical.
IS 11008:1984 Methabenzthiazuron water dispersible powder concentrates (with Amendment No. 1).
IS 11009:1984 Chlorfenvinphos granules (with Amendment No. 1).
IS 11010:1984 Ziran colloidal suspension.
IS 11015:1984 Ammonium chloride for cosmetic industry.
IS 11019:1984 Carbofuran, technical.
IS 11020:1984 Methods for determination of carbofuran residues in crops, soil and water.
IS 11021:1984 Methods for determination of dimethoate residues in food commodities.
IS 11023:1984 Borax for cosmetic industries.
IS 11063:1984 **Metoxuran** water dispersible powders (with amendment No. 1).
IS 11112:1984 Alumina, chromatographic grade.
IS 11126:1984 3-Toluidine.
IS 11135:1984 Metoxuran, Technical
IS 11141:1984 Code of safety for acrylonitrile.
IS 11151:1984 Barium carbonate pesticidal grade.
IS 11176:1985 3,3'Dichlorobenzidene salts.
IS 11177:1985 4,Nitro-2-toluidine.
IS 11181:1985 Sulphotobias acid.
IS 11236:1985 Manganese acetate.
IS 11237:1985 Manganese carbonate.
IS 11305:1985 Thionyl chloride.
IS 11355:1985 Phenyl-naphthylamine.
IS 11374:1985 Methods for determination of monocrotophos residues in food.
IS 11487:1985 Sodium lauryl ether sulphate.
IS 11540:1985 **Michlers ketone.**
IS 11567:1986 2-Naphthylamine, 3-6, 8 trisulphonic aci
IS 11637:1986 Specification for calcium base, E.P. grea
IS 11657:1986 Phosphorus oxychloride, technical.
IS 11673:1986 Sodium hypochlorite solution.
IS 11686:1986 Iso-propyl alcohol, food grade.
IS 11744:1986 Phosphorus pentachloride, technical.
IS 11751:1986 Sodium sulphite, anhy., photographic gr.
IS 11752:1986 Sodium metabisulphite, photographic grad
IS 11774:1986 Method for determination of dichlorvos res dues in food commodities.
IS 11782:1986 **Sodium cyanide.**
IS 11784:1986 Carbaryl BHC (GAMMA) granules.
IS 11785:1986 Captan WP (with Amendment No. 1).
IS 11788:1986 4-amino-3-methyl-N-diethyl aniline HC
IS 11811:1986 Alkyd resins.
IS 11883:1986 Ready mixed paint, brushing, red oxide, pri ing for metals.
IS 11911:1986 Caffeine, food grade.
IS 11913:1986 Tert-Butylhydroquinone (TBHQ).
IS 11995:1987 **Isoproturon, WP.**
IS 11996:1987 **Deltamethrin EC.**
IS 11997:1987 Fenvalerate EC (with Amendment No.
IS 12003:1987 Fenvalerate, technical (with Amendment 1, 2, and 3).
IS 12004:1987 Isoproturon, technical (with Amndt. No.
IS 12005:1987 Deltamethrin technical.
IS 12015.1987 Cypermethrin, technical (with Amendn No. 1 & 2).
IS 12016:1987 Cypermethrin EC.
IS 12017:1987 Cypermethrin technical concentrate ( Amendment No. 1 and 2).
IS 12019:1987 2'-Chloro-(4-sulphophenyl)-3-meth pyrazolone.
IS 12033:1986 Code of safety for dinitro toluene.
IS 12034:1986 Code of safety for methyl bromide.
IS 12039:1986 Spent bleaching earth.
IS 12084:1987 Specification for morpholine.
IS 12086:1987 Specification for hydrazine hydrate.
IS 12113:1987 Ferrous sulphate heptahydrate, agri. g
IS 12121:1987 Sodium carbonate, anhydrous, photo g
IS 12125:1987 Benzotriazole, photographic grade.
IS 12141:1987 Code of safety for methyl ethyl keto
IS 12142:1987 Code of safety for 1, 1, 1 trichloro et
IS 12143:1987 Code of safety for tetrachloroethane.
IS 12178:1987 Acetylene black.
IS 12201:1987 Hydro fluosilicic acid for electroplati
IS 12210:1987 Caprolactam.
IS 12276:1988 Dextrin for explosives and pyrotechni
IS 12277:1988 Polyethylene glycol 400.
IS 12282:1988 Limits for emission for carbon black ind
IS 12283:1988 Limits for emission from calcium c industry.
IS 12345:1988 Vinyl acetate monomer.

382:1988 Tetradifon technical.
383:1988 Tetradifon EC.
408:1988 Gum karaya, food grade.
438:1988 Dimethyl terephthalate.
478:1988 Ammonium sulphate, technical.
495:1988 Potassium ferricyanide (photographic grade).
2501:1988 Ferbam, technical.
2502:1988 Glyphosate, technical.
2540:1988 Acrylonitrile, technical.
2562:1988 Ferbam WP.
2590:1988 Glycerine for cosmetic industry.
2609:1989 Indian standard pesticides — residues in foods nthion — method for determination.
2610:1989 Indian standard pesticides — residues in foods hosphamidon — method for determination.
2611:1989 Indian standard pesticides — residues in foods nd water — endosulfan -- method for determination.
2616:1988 Indian standard pesticides — residues in foods ypermethrin, deltamethrin, fenvalerate and permethrin — nethod for determination.
12618:1989 6-Chloro-2-aminophenol-4-sulphonic acid (technical)
12628:1989 2-Amino-4-nitrophenol, technical.
12684:1989 Calcium stearate for explosive and pyrotechnic industry.
12685:1989 Pendimethalin, technical.
12706:1989 Dye intermediates-naphthol AS-E-specification.
12707:1989 Naphthol AS-D.
12715:1989 Polyvinyl alcohol for sizing of paper.

**ddenda**

S 574:1989 Glassy sodium metaphosphate -- Specification (fourth revision)
S 877:1989* Actvated carbons, powdered and granular —Methods of sampling and test (second revision).
IS 1065:1989* Bleaching powder, stable — Specification (second revision).
IS 1420:1989 Light basic magnesium carbonate (II revision).
IS 2741: 1989* B-Naphthol — Specification (II revision).
IS 2752:1989* Activated carbons, granular — specification (second revision).
IS 3242:1989* B-Oxynaphthoic acid (BON acid) — Specification (first revision).
IS 4048:1989 Density — Composition tables for aqueous solutions of sulphuric acid — Specification (first revision).
IS 4321:1989 Pesticides — 2,4-D technical — Specification (second revision).
IS 4523: 1989* Acetoacetanilide — Specification (I revision).
IS 4524: 1989* Acetoacet-o-chloroanilide — Specification (first revision).
IS 7395:1989 Gum ghatti — Specification (first revision).
IS 7950:1989* Pesticides — Fenthion, technical — Specification (first revision).
IS 8120:1989 Schaeffer's acid (sodium salt), technical —Specification (first revision).
IS 8366:1989* Activated carbons, powdered — Specification (first revision).
IS 12751: 1989 Pesticides — Pendimethalin AC
IS 12768: 1989 Pesticides — Thiobencarb, technical
IS 12769:1989* Pesticides — Thiobencarb FC
IS 12846:1989* Boric acid, photographic grade — Specification.
IS 12847: 1989* Carbon bonded silicon carbide — Graphite crucibles — Specification. **(Concluded)**

* Standards under print.

For further information contact: Bureau of Indian Standards, Manak Bhavan, 9, Bahadur Shah Zafar Marg, New Delhi 110 002 or their Bombay office at Novelty Chambers, Grant Road, Bombay 400 007.

**Required Regularly**

**SODIUM METABORATE**

**Manufacturers to please contact**

**JAI AGENCY**

38-D, Burkit Road, T. Nagar, Madras 600 017.
**Phones: 442042, 440474**

**V.V.Trans Investments Private Limited**

ANNOUCEMENT

EXCELLENCE
THROUGH
QUALITY

**V. V. TRANS
Investments
Private Limited**

ANNOUNCES
WITH PRIDE
THE COMMISSIONING
OF THEIR PLANT FOR
THE MANUFACTURE OF

**CHLORINATED
PARAFFIN
WAX**

(HNP / WAX BASED -
DIFFERENT GRADE)

FOR YOUR REQUIREMENTS
DEALERS/ACTUAL USERS
PLEASE CONTACT

**M/s. V.V. TRANS
INVESTMENT
PRIVATE LIMITED**

R.O. 43/262, New Sankalbagh
Narasinga Rao Pet,
Kurnool -- (A.P.)
**Telephone: 21381**
**Telex: 0815-216**

**For Quality Products and Competitive Rates**

**DI BUTYL PHTHALATE (D.B.P.)**
**DI OCTYL PHTHALATE (D.O.P.)**
**DI OCTYL MALEATE (D.O.M.)**
**DI BUTYL MALEATE (D.B.M.)**
**BUTYL STEARATE**
**OCTYL STEARATE**
**OCTYL ACETATE**

Contact Manufacturers

**Enbichem Industries**

219/224, Madhani Estate, P.B. No. 7039, Dadar, Bombay 400 028.
**Phone: 4225392/4228968**

BP MEKP

Jain

- **BENZOYL PEROXIDE**
- **M.E.K. PEROXIDE**
- **T-BUTYL HYDROPEROXIDE**
- **T-BUTYL PER BENZOATE**
- **DI TERTIARY BUTYL PEROXIDE**
- **ALUMINIUM ISOPROPOXIDE**

Contact Manufacturers

**Jain & Jain**

214/A JANJIKAR STREET
BOMBAY-400 003
PHONE:
323097 • 321652 • 328765

**TBHP • TBPB • DTBP**

# Science Briefs

## MULTI-DIMENSIONAL STUDY N ENERGY

The 16-year old Tata Energy esearch Institute (TERI) has underken a study on energy policy, energy ngineering, biological sciences and omputer and information sciences, to ompile information on all aspects of nergy. Each of these broad areas of esearch has been further subdivided.

TERI prepares project reports of oil nd coal-based enterprises. It views their upply and use against the backdrop of nvironment, transport, alternatives vailable, etc. Several studies were eing conducted by the researchers in his field.

Another study is on to determine if oking coal should be imported or not. A third one will examine the economies of washing coal meant for power generation. This one will take into account not just the cost of transporting unwashed coal but also what it will take to safeguard the environment if unwashed coal is used in power generation. Other allied factors will also be considered.

The latest in a battery of energy models is the TERI energy-economy simulation and evaluation (TEESE) model. This is essentially a mathematical model which captures the inter-relationship between economy and energy. TERI has used it to forecast energy demands for various sectors for the terminal years of the Eighth and Ninth Plans.

A mathematical model may seem to be deceptively theoretical for some thing as nebulous as energy. However, this model takes into account the contribution of various sectors to the demand for power and helps to work out how to blunt its impact. It was done for the Government and has been used by the Ministry of Urban Development, DNES, the European Commission and the World Bank.

The fuel cycle is the thrust of TERI's analysis of the relationship between energy and environment. A study has shown that the "improved" stoves are more efficient in their use of fuel but are more polluting than conventional ones. This study was funded by the Ministry of Environment and has been used, among others, by DNES.

Researchers in this department have carried out risk-benefit analyses of large power projects — thermal, hydel and nuclear. It has conducted air-pollution monitoring for the national capital region as well as energy use in the region. The Ministry of Environment has designated it as the centre for the region. It will be the resource base for material and research on the energy-environment interface.

Global warming has been on the centrestage of late and TERI is not lagging behind in this area either. It has become a centre for global warming with the focus on South Asia. It holds two or three workshops every year on the subject, conducts policy-related research and collaborates with institutes in other countries. The aim of the game is to assess India's options in the global warming game and help out with discussion at international forums.

Technological research is restricted to renewable energy resources, hardware for such sources and photovoltaic technology. The latter is currently the main route for converting solar power into electricity and TERI is striving to figure out ways to improve it. TERI is not all research. It conducts energy audits on request, mainly from private companies. Expectedly, it has encountered poor maintenance, inefficiencies and the like at the plant level. At the unit level, companies use excessive energy through deploying overrated motors.

If, for example, the work load justifies using a one horsepower motor, the establishment will instal a three HP one. Boilers also have a low efficiency factor. This can be raised by at least 10 per cent without much sweat. There is little use for research work if it is not accessible to by others. The documentation centre specialises in making information available to anyone. It comprises an energy documentation centre, a library, a publications unit and documentation and information services.

The library has developed its own software for sorting and presenting information. This has sorted the volumes of information into databases. In addition, this branch of TERI has made two films, one on bio-gas technology and the other on global warming. Biological sciences research covers microbiology, oilseeds and microrhyzha. TERI has been designated as the microryzha information centre for Asia.

Microbiology is concerned mainly with improving the strains of bacteria which produce bio-gas from the degradation of biological waste. Microrhyzha research aims at improving the capacity of such organisms to enrich the biomass.

Funds have been forthcoming from the Department of Biotechnology for developing tree plantations using clones. There have been several projects undertaken with varying degrees of success in collaboration with the Forest Departments of various States.

Oilseeds research has tried to develop hybrid seeds, particularly those of mustard and rapeseed. These seeds are amenable to general engineering with the final goal being to develop a male sterile line which will facilitate hybridisation. There has been a degree of success where rapeseed is concerned but none in mustard. Technology for further development of hybrid lines is up for grabs and private companies may be interested.

## -WASTE BOTHER COOLS DOWN

Nuclear waste disposal has given many a sleepless night for the nations ll over the world with the growing tockpile of spent fuel rods from commercial reactors. But now, 'glassificaion', a new technique perfected in the US has radiated fresh hopes.

The US scientists say by 1992 there will be a permanent end to the problem of disposal of N-waste problems. In glassification, highly radioactive materials are separated from other components of stored liquid waste and are mixed with molten glass.

The glass cools and hardens inside canisters, which are two metres in diameter and 10 feet in height. Each canister can hold about 3,700 pounds of glassified waste and the containers are buried deep inside the earth, leaving little chance for the radioactive waste to contaminate the earth.

The present methods being used are burial of tanks filled with N-waste deep under the earth and indiscriminate dumping into oceans. These have proved highly hazardous.

The glassification method has already been put into use by France and Belgium and has proved effective. In the US, a $900-million defence waste processing facility is coming up at Savannah river. This will be the largest radioactive waste disposal facility in the world. This may pave way for other countries to follow suit and help give N-waste a safer burial.

## GEOTHERMAL ENERGY

A recent ambitious proposal of the Hawaiian Government to tap the geothermal energy flowing from volcanoes has hit rough weather. The Government, realising that there is immense potential in harnessing electricity from flowing lava, has launched the Hawaiian geothermal deep water project. This will connect the Kilovea volcano by a 100-mile long cable to the island and help generate power.

But the project has been attacked by environmentalists who feel that this will endanger the lives of humpback whales and the unique tropical forests. Small projects, which have been implemented already to tap geothermal energy, has brought mixed returns. But the environmentalists recently forced the closure of one such project in Hawaii because it sparked off a series of accidents, much to the shock of the natives.

## RECYCLING GATHERS MOMENTUM

Recycling is gathering momentum world-wide. And the US corporations are jumping into the fray to contribute their mite. They are out to create a ready market for recycled products. Not only that, they say efforts in recycling have its spin-off benefits — like getting a better image before the public, who are scrambling to join the green movement.

McDonalds of the US has already reserved a $100-million or 25 per cent of its annual construction and remodelling budget for buying recycled products. Other corporations like Rubber-maid Commercial Products Inc are beefing up its recycling infrastructure. McDonald has joined hands with national polystyrene recycling to launch a project backed by several chemical giants for recycling polystyrene food packaging from 450 of its New England restaurants. It plans to cover 8,200 restaurants by 1992 but the pains of corporate citizenship are not without resistance.

Some greens have blasted this recycling as a misguided policy since they have advocated for total abolition of polymer products rather than recycling. But many feel that insistance on absolutes is as stupid as indiscriminate pollution of atmosphere.

## NATURAL MEANS TO COMBAT PESTS

At a time when the pesticides are attracting a lot of flak, the US Department of Agriculture (USDA) has come out with a new solution. It is launching a campaign to develop natural enemies to replace toxic pesticides. The USDA's lab at Tifton in Georgia has found a parasitic wasp which can seek and attack insects.

The wasps lay eggs in caterpillars to reproduce. When the eggs hatch, the developing wasps eat the caterpillars. But the wasps are facing obstacles in getting to their target and they are being trained. The female wasp uses odou and visions to get at the caterpillar fo laying her eggs.

The lab's first targets are corn ear worms and tobacco bud worms, tha infect 100 different plants includin corn, cotton, soyabeans, clove and tomatoes. So the days are not far off whe the wasp will be patrolling crop fields And the scientists are hopeful that could happen any time between now and 1995.

## ONTARIO PLAN TO PHASE-OUT CFCs

Ontario has taken up an ambitiou regulation plan of CFC ban and phas outs. It plans to reduce CFC use by 5 per cent by December, 1993. And th programme includes a ban on use CFCs in slurries used to prepare ae osols; capture and recycling of CFC during servicing; a staged ban ful effective by the end of July 1993, CFC use in rigid foam for furniture e Perhaps a very ambitious plan, but ma countries can learn a lesson from t energy and verve with which these pr posals are being launched by th Canadian province.

## NE THERAPY TO TREAT NCER, OTHER DISORDERS

U.S. federal review panel has roved the world's first use of a ther- in which new genes are inserted into cells of patients to treat disease. The combinant DNA Advisory Commit- of the National Institutes of Health IH) on July 31 approved the use of ground-breaking procedure, known human gene therapy, to treat patients th a malignant skin cancer and chil- en with a genetic disorder that stroyed their immune systems.

The proposed experiments are pected to receive approval from both e acting Director of the NIH and the .S. Food and Drug Administration, ermitting human trials to being within month or two. "This is a truly historic oment", said Dr. Gerard McGarrity, hairman of the Advisory Committee nd president of the Cornell Institute for Medical Research in Camden, New ersey.

In principle, the new technique will allow doctors to introduce any necessary gene into human cells lacking healthy counterparts. Genes provide the blueprints cells need to guide their protein-making apparatus. The proteins function as enzymes that control chemical reactions or as hormones that signal cells to carry out some action.

### Could be tried for AIDS

Researchers believe that gene therapy may prove valuable in the battle against cystic fibrosis, familial cholesterol disorders, metabolic deficiencies of the liver and other genetic disorders. The method could also be used to implant foreign genes that would make compounds attack tumour cells selectively, or even the virus that causes AIDS.

One set of experiments approved by the panel calls for the treatment of with advanced melanoma, a lethal skin cancer for which there is no effective treatment. The therapy would involve giving extra potency to white blood cells by inserting a gene that causes the cells to produce tumour necrosis factor, a natural substance in the body that fights tumour cells.

Dr. Steven Rosenberg of the National Cancer Institute, who developed the technique in mice, said that the special gene inserted into the cell had been fashioned to generate up to 100 times the amount of tumour necrosis factor normally found in the body. Blood cells with the gene will be injected into patients with the hope that they will invade tumours and release enough of the necrosis factor to destroy them without harming the surrounding tissue. The technique could also be used to treat breast, colon and other common cancers.

The second procedure approved by the panel would be used to treat young children suffering from adenosine deaminase deficiency, a genetic disorder that destroys the immune system. The disease is rare, affecting no more than 20 patients in the world at a time.

Researchers predict that children initially will need monthly infusions of cells, but they believe a permanent cure may ultimately be achieved by inserting the gene into bone marrow cells that produce all the blood cells in the body.

## CITRIC ACID LOWERS PESTICIDE RESISTANCE

Pesticide scientists could take a cue from the work of S.B. Hasan and others at the Central Food Technological Research Institute, Mysore.

The scientists studied the effect of feeding citric acid to houseflies and their resistance to insecticides. The insecticides studied were, permethrin, malath-

MCA
MONOCHLORO ACETIC ACID
EDTA
ETHYLENE DIAMINE TETRA ACETIC ACID
NTA
NITRILO TRI ACETIC ACID
DTPA
DIETHYLENE TRIAMINE PENTA ACETIC ACID
And Special Auxiliaries and Chemicals.
CHELATING AGENTS
AND THEIR SALTS AS

MFRS : SHIVCHEM INDUSTRIES
C-1-B, SHED NO. 1307/10, PHASE IV, G.I.D.C. ESTATE,
NARODA, AHMEDABAD-382330. TEL. NO. 812447
OFFICE : NIRAV COMPLEX, 1ST FLOOR, NR. NAVRANG SCHOOL,
AHMEDABAD-380014. T. NO. 495501, 491488

AGENT FOR MAHARASHTRA STATE
SHREE AMRUTA ORGANICS PVT. LTD.
813, RAHEJA CENTRE, 214, NARIMAN POINT,
BOMBAY-400 021. PHONE : 240415, 243979, 2873680

n, bromophos and lindane. Solutions these were applied to three to four y-old houseflies which were also fed ric acid. In the second generation $_2$) houseflies there was a fall in the antity of insecticide required to kill ) per cent of each batch. There was a multaneous increase in the citric acid ontent of the houseflies, which in the generation was almost thrice that of ormal flies.

The scientists, in a report in *Current cience*, attribute to citric acid changes ke delayed egg-laying, reduction in the umber of eggs laid and a slight prolongation of the life-style. They are at a oss, however, to explain the mechansm of lowered resistance of the insects o insecticides, beyond assuming that he higher citrate level slows down the glycolysis rate, thus reducing the energy for work. (Glycolysis is the conversion of glucose by enzymatic action into lactic acid for energy purposes.). Low energy production is assumed to result in reduced resistance to insecticides. The scientists tentatively suggest that the inclusion in pesticide formulations of a chemical like citric acid would help lower insecticide resistance in insects.

## SHELF LIFE OF BLOOD INCREASES

Two Australian researchers have made a significant breakthrough in the quest for a means to extend the "shelf life" of blood plasma. Dr. Michael Guppy, of the University of Western Australia, and Dr. Max Whisson, Deputy Director of the WA Red Cross Blood Transfusion Service, can keep donar blood fresh for nine days, two more than is universally accepted as safe.

They are confident that with further experimentation they will be able to extend the safe storage period even longer, saving waste, more lives and millions of dollars around the world.

The key to their breakthrough comes from study of the behaviour of the blood's vital clotting cells, platelets. This ingredient is given in life-saving transfusions in treatments for leukaemia, aplastic anaemia and bone marrow transplants, and to counteract bleeding in accidents and surgery.

After the blood is collected in bags of glucose, the platelets are centrifugally separated from the red cells, both remaining in the glucose mixture. The red cells convert the glucose to energy and remain viable for up to 28 days.

Adding acetate replaced a natural energy source in the platelets, thus extending their lives. The researchers are now concentrating on identifying the internal fuel, after which they can design a storage medium containing it so that platelets can be stored for long periods. Even the modest increase in storage time would decrease the percentage discarded to five per cent.

**M/s. AROMA AGENCIES**

**(Group Company of M/s. ENGINEERING & CHEMICAL CORPN.)**

**Are pleased to announce their appointment**

as

**SOLE DISTRIBUTOR**

by

**M/s. DIAM ORGANIC CHEMICAL INDUSTRIES PVT. LTD.**

**Mahad Maharashtra**

For their products:

**Ethyl Cellosolve (Ethylene Glycol Mono Ethyl Ether)**

**Ethyl Carbitol (Di Ethylene Glycol Mono Ethyl Ether)**

Being offered from ready stock

Please Contact:

**AROMA AGENCIES**

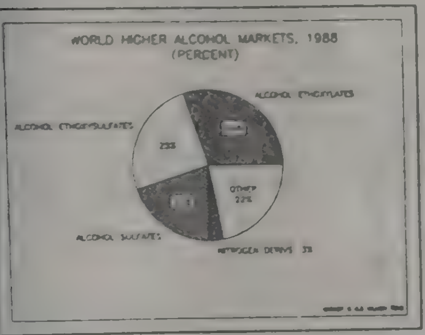
201, Jyoti Chambers, 372, Narsi Natha Street, Bombay 400 009.

Tele: 33 5051-2-3, 34 2512, 32 5335 Cable: ALCHAGE, Bombay 9. Telex: 011-76524 ROMA IN

# News from Abroad

## RLD HIGHER ALCOHOL RKET TO GROW 3.5 PER NT PER YEAR

The total market for $C_{12+}$ higher ohols will rise from 0.9 million nes in 1988 to almost 1.5 million nes by 2000, a 3.9 per cent annual e. Over 75 per cent of higher alcols are used to produce surfactants h as alcohol ethoxylates, alcohol oxysulphates and alcohol sulphates.



Alcohol demand for surfactants will row from 0.8 to 1.3 million tonnes etween 1988 and 2000. Surfactants hemselves will grow from a 6.9 million onnes market in 1988 to 10 million onnes over the same period. These are mong the findings of a recent study, High alcohols — World markets, 1988-2000 from Colin A. Houston & Associates, Inc. (Mamaroneck, NY, U.S.A.).

Higher alcohol production capacity will rise in response to increasing demand. Capacity growth will average 4.15 per cent per year to 2000, but between 1988 and 1995, the rate will be over 6 per cent. "Many esablished producers have increased or are planning to increase their capacities but new producers continue to be attracted to this market for a variety of reasons", states project leader Joel Houston. "Low natural feedstock costs, the need to add value in developing countries and a perceived desire for 'natural' products are driving expansions in this industry." An uncertainty is the role that oxo alcohol producers will play in the future. Oxo production levels could increase substantially providing that consumers choose these types of alcohols. The table given below forecasts capacity vs. demand.

Most of the capacity growth will be for natural alcohol, particularly in developing countries. Natural alcohol production is expected to increase proportionately based on relatively stable lauric oil supply and price, and a healthy by-product price outlook. Natural alcohol production economics remain vulnerable to by-product glycerine. If the glycerine price declines due to oversupply, there is a corresponding decline in by-product credits to the alcohol process. At risk is the competitiveness of the natural producer.

"The new natural alcohol producers are gambling that growth in consumption will prevent any permanent decline in glycerine pricing. The effect of a decline will be greater or lesser depending on the by-product accounting practices used", adds Joel Houston. The major producers of alcohols, Shell, Henkel, Procter & Gamble, have been expanding operations and new plants are underway. Shell is fully integrated and maintains a dominant position in alcohol ethoxylates. Most producers are integrated into derivatives and/or raw materials. Henkel and Procter & Gamble are the major natural alcohol producers with Kao quickly developing a natural alcohol position of growing importance. All of these producers use alcohols internally and their positions are explored in the report. Captive use of the alcohol varies regionally, but averaged 50 per cent of consumption in 1988.

As part of the by-product and market evaluation, the CAHA study examined basic oleochemicals. Methyl esters have the highest growth of these products due to their anticipated use in methyl ester sulphonates. (Refer table on page 114).

**Higher alcohol — World capacity forecast**
**(thousand metric tonnes)**

| | 1988 | 1990 | 1995 | 2000 |
|---|---|---|---|---|
| Natural | 525 | 615 | 808 | 855 |
| Synthetic | 788 | 815 | 855 | 855 |
| **Total capacity** | **1313** | **1430** | **1663** | **1710** |
| Total consumption | 925 | 1000 | 1220 | 1465 |
| Operating rate | 70% | 70% | 73% | 86% |

## ICI SELLS FERTILISER DIVISION TO FINLAND

Imperial Chemical Industries (ICI) one of the world's top four chemicals groups, surprised the city of London by announcing a 21 per cent decrease in pre-tax profits for the first six months of 1990, a far bigger fall than had been expected. The fall in profits was from £925m ($1.68bn) for the first half of 1989 to £733m for the same period this year. It coincided with the announcement of the sale for about £75m of ICI's loss-making UK fertiliser operations to Kemira of Finland. The sale will involve the loss of 640 jobs at ICI's fertiliser plants at Billingham on Teeside.

It will also mean the effective withdrawal of the company from western Europe's £7 bn a year fertiliser industry, a field in which the company has been a major participant since the 1920s. The business has been deeply troubled for the past decade as a result of over-capacity, poor demand from farmers and cheap imports which have depressed prices. ICI, the seventh biggest company in the west European fertiliser sector, has suffered losses on its fertiliser operations for the past four

**Basic oleochemical production data, 1988-2000 (thousand metric tonnes)**

| type | 1988 | 1995 | 2000 | Annual Growth 1988-2000 |
|---|---|---|---|---|
| ty acid | 2230 | 2575 | 2860 | 2.1% |
| thyl ester* | 110 | 175 | 232 | 6.4% |
| ty alcohols | 364 | 581 | 627 | 4.6% |
| ycerine | 510 | 600 | 664 | 2.2% |
| **Total** | **3214** | **3231** | **4383** | **2.6%** |
| **region** | | | | |
| rth America | 711 | 865 | 963 | 2.6% |
| est Europe | 1122 | 1287 | 1401 | 1.9% |
| sia | 659 | 914 | 1045 | 3.9% |
| her | 212 | 265 | 310 | 3.2% |
| **Total** | **3694** | **3331** | **3619** | **2.6%** |

Does not include methyl ester for alcohol production

ears. The poor figures from ICI underne the problems facing many other arge international chemicals companies, particularly in the UK and the US. CI's results cast a shadow over the ondon stock market. The company's hares dropped in value by 6 per cent over the day, closing at 1040p, down 55p. Sir Denys Henderson, ICI chairman, was unwilling to comment on prospects for the rest of 1990. However, he indicated that the company faced a tough few months.

"We are going to pull in a few notches", he said, emphasising the need for productivity improvements across the company. The fall in profits by ICI was especially marked for many of the company's bulk chemicals operations, which have been hard hit by falling prices and signs of over-capacity in many developed countries.

ICI's petrochemicals and plastics division recorded a trading profit for the first half a £88m, compared with £234m for the equivalent period in 1989. Profits in this part of ICI's activities for the first half of last year had been inflated by the boom then taking place in the world chemicals industry.

The divestment of ICI's UK fertiliser activities, which have annual revenues of about £400m, leaves the company with roughly £600m a year of fertiliser sales outside Europe. These come from plants and marketing operations in Australia, Canada, Malaysia and India. Under the agreement with the state-owned Kemira, the Finnish company will strengthen its position as western Europe's second biggest fertiliser producer. The company in recent years has shrugged off the problems affecting many other large European groups in this industry and has expanded production, mainly by acquisition.

## MONTEDISON TO MERGE WITH FERRUZZI

Montedison, the leading Indian chemicals concern, is merging with Ferruzzi Agricola Finanziaria (FAF), the agro-industrial holding company of the Ferruzzi group, to create one of the biggest industrial conglomerates in Italy. The new entity will form a plastics to soya-beans empire with estimated sales of almost L15,000 bn (£6.97 bn) a year and net earnings of almost L1,000 bn.

The merger will also remove one layer in the complex structure of the Ferruzzi group of companies, which includes chemicals, sugar and pharmaceuticals among its main activities, and lead to direct control of Montedison through Ferruzzi Finanziaria (Ferfin), rather than through FAF as at present. Describing the merger as "a response with the latest technology to new challenges", Mr. Raul Gardini, Ferruzzi's chairman, defended the industrial logic of the deal, which had been expected for some time in one form or another.

Linking the cyclical chemicals business with Ferruzzi's more stable cash-generating agro-industrial interests would produce a much stronger entity, according to Mr. Giuseppe Garofano, Montedison's managing director. FAF already owns 48.7 per cent of Montedison's shares.

## PROGRAMME ANNOUNCED FOR 1990 ENVIRONMENTAL CONTAMINATION CONFERENCE

The programme has been announced for the 4th International Environmental Contamination Conference to be held in Barcelona, Spain, 1-4 October 1990. This conference, the fourth in a biennial series, will present the latest technological developments and research results relating to environmental contamination of the air, soil and water.

Over 220 papers from 37 countries will be presented within the areas of contaminant movement in the environment — specific sessions will cover atmospheric pollution, sewage sludge and waste treatment, health effects, toxic waste and biomonitoring. The event, sponsored by the United Nations Environment Programme (IRPTC) and World Health Organisation will attract a large, international delegations from various fields concerned with environmental technology.

To obtain a copy of the programme and invitation to register, contact: Environmental Contamination Secretariat, CEP Consultants Ltd., 26-28, Albany Street, Edinburgh, EH1 3QH, UK. Tel.: + 44 31 557 2478, Fax: + 44 31 557 5749.

# Biotechnology

## AXO UNVEILS BROAD EVELOPMENT PROGRAMME

Glaxo unveiled a significant portfo- of drug compounds currently under velopment at its recent annual R & update. Since its 1989 update, the mpany has also received three mar- ting approvals, for **Zofran, Flixonase** d **Zantac** at higher doses; and has led five product licence applications, r fluticasone propionate topical and tranasal, lacidipine, salmeterol and efuroxime axetil suspension.

A new compound, ranitidine bismuth itrate GR19065 AM has entered a full levelopment programme for the treat- nent of peptic acid diseases as has ondansetron for the treatment of generalized anxiety. In total, Glaxo has seven compounds involved in nine full development projects and seventeen in exploratory development.

Of the approvals, **Zofran** (ondansetron) has been launched in the UK, France and New Zealand for the management of nausea and vomiting induced by cancer chemo — and radiotherapy. In the US, the advisory committee of the Food & Drug Administration has recommended approval for the injectable form and a New Drug Application for the oral form will be filed shortly. Zofran has also recently entered the full development programme for the treatment of post-operative nausea with first filing expected in early 1991. **Flixonase** (Fluticasone propionate) in intranasal form for seasonal rhinitis was approved in the UK, while **Zantac**, at higher doses, has received approval in the UK and Italy for the treatment of duodenal ulcers and reflux oesophagitis.

### Licence applications

Product licence applications (PLA) have been filed for salmeterol, a long acting beta-agonist for the treatment of asthma, in both aerosol and dry powder formulations; the anti-inflammatory steroid, fluticasone propionate, in topical form for skin diseases; the calcium antagonist, lacidipine, for the treatment of hypertension; and the oral cephalosporin **Zinnat/Ceftin**, in suspension form.

The first filing application for both oral and subcutaneous forms of sumatriptan for the treatment of migraine and cluster headache is expected in July.

In addition to ranitidine bismuth citrate for which Glaxo is hoping to submit a product licence application in 1993/94, and the 5HT-antagonist ondansetron, for which a PLA is expected in the first half of 1993, three other compounds are in full development.

Fluparoxan, an alpha-antagonist is in clinical trials for the acute and maintenance treatment of depression, with first PLA expected in the second half of 1993, while studies for the prevention of reocclusion following angioplasty with vapiprost GR329191, a thromboxane receptor antagonist, have been completed and are under evaluation. Finally GR69153, a long-acting parenteral cephalosporin has been placed on "hold" to evaluate potential hypersensitivity reactions seen in human studies.

In exploratory development, GR103365, an anti-viral compound for the treatment of Aids, licensed from IAF BioChem, is undergoing preclinical evaluation. GR90352, previously described as carbovir has, meanwhile, been dropped from the programme. Another anti-viral GR91568 has entered exploratory development for herpes viruses (HSV-1) and varicella (shingles), while the broad spectrum cephalosoprin licensed from Mochida, is undergoing Phase I clinical studies in Japan.

In the field of gastrointestinal diseases, a 5-lipoxygenase inhibitor, GR80907 has entered exploratory development to determine its potential anti-inflammatory properties. The prostaglandin agonist GR63799 is being studied as a potential cytoprotective agent, while GR87442 is under evaluation as a potential anti-emetic and in the treatment of irritable bowel disease.

A squalane synthase inhibitor GR105155 has entered exploratory development with the potential to treat hypercholesterolaemia and hypertriglyceridaemia, as has a $5HT_1$-like agonist for migraine, GR40370. Another $5HT_1$-like agonist for migraine, GR85548 continues in development along with GR70236, an adenosine $A_1$-agonist, being studied as a potential anti-lipolytic agent in the treatment of Type II diabetes, and an HMG Co-A reductase inhibitor GR95030, under development as a potential lipid-lowering agent for atheroma.

### Research expenditure

Glaxo estimates its operating expenditure on research will amount to £410m ($687m) in the 1989-90 financial year ending. This represents a 27 per cent increase over 1988/89, which itself saw a 40 per cent increase over the previous financial year. Of the 1989/90 total, 46.7 per cent was accounted for by Glaxo Group Research in the UK, with 27.1 per cent being invested in the US, followed by Italy, 6 per cent; France, 3.6 per cent; Japan, 2.8 per cent; and Canada, 2.1 per cent.

Total R & D capital expenditure has plateaued around the £255-260m/year level, but is expected to decline in future years to reach around £110-115m/year by 1994/95. Expenditure by Glaxo Group Research will continue to increase intil 1992/3, when it is expected to peak at £225m.

## ITC RULES ON DISPUTE OVER DOXORUBICIN

Bristol-Myers Squibb pronounced itself "gratified" by the recent Inter-tional Trade Commission (ITC) decion that the company's anti-cancer drug ubex (doxorubicin) does not infringe process patent owned by Italy's Faritalia Carlo Erba and exclusively censed in the US to Erbamont. The dria Laboratories division of Erbaont markets doxorubicin **Adriamcyin**.

The ITC administrative law judge uled the process patent is invalid and nenforceable. He also found that the nanufacturing process used by Meiji Seika Kaisha, of Japan, from which Bristol-Myers Squibb imports doxorubcin, does not infringe the patent. Lastly, he judge also ruled that the doxorubicin imported into the US by Erbamont for sale by Adria is not made by the Farmitalia process.

In a separate but related case in the US District Court in Delaware, Bristol-Myers Squibb has sought a declaratory judgement that the Farmitalia patent be declared invalid, unenforceable and not infringed by the process used to manufacture the compound it imports.

Following a counterclaim by Erbamont for infringement, Bristol-Myers Squibb sought a summary judgement of non-infringement on the grounds that it had imported the doxorubicin prior to the 23 February 1989 date of the process patent legislation on which Erbamont's claim was based. A summary judgement was obtained and the case dismissed in April 1990. Erbamont is awaiting the result of an appeal.

The ITC judge has also issued a strong decision in favour of biotech firm Cetus over the bulk importation of doxorubicin from an Italian supplier, Sicor. Erbamont had sought to block the importation by Cetus and its venture partner, Ben Venue Laboratories, by alleging Sicor was infringing the process patent involved in the Bristol-Myers action. In a separate court action in California, Cetus has charged Erbamont and its parent Montedison, and their affiliate, Farmitalia, with unfair competition and violation of US antitrust laws.

Doxorubicin is said to be the most widely prescribed anti-tumour drug in the US, with sales exceeding $160m.

## LEDERLE APPROVAL

Lederle Laboratories, a division of American Cyanamid, has received US Food & Drug Administration approval to market **Verelan,** an improved formulation of Verapamil HCl, said to be the most widely prescribed calcium channel blocker for hypertension.

**Verelan,** the first controlled absorption verapamil product to use pellet-filled capsule technology, was developed by Elan Corp. of Athlone, Ireland using its proprietary **Sodas** technology.

## GENENTECH CLAIMS AIDS VACCINE TRIAL SUCCESS

San Francisco-based biotech firm Genentech has announced it has successfully tested an experimental Aids vaccine on chimpanzees. However, the company has been at pains to point out that a commercial human vaccine is still a long way off. The announcement is also unusual in that it comes before the official publication of the test results, but was sanctioned to permit full discussion of the company's development programme at its AGM at the end of the first week of June 1990.

In the test, two chimpanzees were vaccinated with a gene-spliced copy of the Aids virus' outer coat, named gp 120. These animals, together with a third control animal, were challenged with the same virus strain. Six months after exposure, the vaccinated animals have shown no sign of infection. However, the control animal developed signs of infection some seven weeks after exposure. Genentech's announcement has followed similar reports from the Pasteur Institute in Paris, where chimpanzees had been vaccinated with a mixture of a number of virus proteins, and from US researchers who had used a vaccine based on killed virus earlier this year.

Genentech's success has revived its Aids vaccine programme, which had been scaled down in 1987 as a result of earlier failures. The company is now planning human testing as soon as appropriate arrangements have been made with the US authorities, which include the Food & Drug Administration and the National Institute of Allergy and Infectious Diseases. Part of the human testing will also look for any possible effects in patients already infected by the Aids virus.

Another US biotech concern, Repligen, also engaged in the search for an Aids virus, is said to be encouraged by the Genentech test. Repligen is also focusing on the virus coat, in particular, a small section known as "the loop", implicated in the stimulation of the body's own defences. To overcome the problem of the many strains of the Aids virus, Repligen also believes it will be necessary to use vaccine mixtures.

## INTERLEUKIN-2 DATA

Researchers from EuroCetus, the European subsidiary of Cetus, the US biotech company, recently presented data on the use of Cetus' investigational anti-cancer drug **Proleukin** interleukin-2 combined with alpha interferon in the treatment of advanced kidney cancer.

In the study, 33 per cent of patients experienced complete responses and 25 per cent of the remaining patients had stable disease while still undergoing therapy. Although the **Proleukin** was administered intravenously in this study, similar results are understood to have been obtained when administered subcutaneously on an outpatient basis, an approach said to markedly reduce the

city of the treatment. With this com-
ation of drugs, a greater than 50 per
t regression of metastatic (spreading)
cer was observed in 37 per cent of
ients.

## /YAMANOUCHI LINK ON BMP

US-based Genetics Institute and
manouchi Pharmaceutical Co., of
kyo, are to form a joint venture for
commercialization and marketing of
enetics Institute's bone growth factors
MPs) and other future products. Gen-
ics Institute will also establish a direct
armaceutical operating presence in
pan and retain exclusive worldwide
anufacturing rights for its BMP pro-
ucts, as well as exclusive marketing
ghts for North America.

The 50-50 jv wil' be established as
corporation in Japan with responsibil-
ty for clinical development and mar-
eting of Genetics Institute's BMP
roducts in Japan. The concern will also have right of first refusal to develop and commercialize in Japan certain other future products developed by Genetics Institute. Initially, the joint venture will utilize Yamanouchi's clinical and regulatory capabilities and the company's sales and marketing activities. An independent sales force may eventually be fielded. The two companies are forming a US partnership for the funding of the worldwide development of pharmaceutical compounds derived from genetically derived BMPs. The partnership will be granted a worldwide exclusive licence to commercialize products developed through Genetics Institute's BMP research programme. BMP's or bone morphogenetic proteins, are capable of inducing new cartilage and bone formation. The process is believed to involve the recruitment of the bone-forming cells, the initial production of cartilage and further development and mineralization of this tissue to form bone. BMP products may be useful in fracture healing, as a substitute for existing bone graft materials and in treating bone-loss disorders.

## NORWAY PRODUCES SOVIET VACCINE

Norwegian-based Biovet Production, part of Euremix group, has begun, production of a ringworm annelid vaccine, effective in cattle, horses, cats and dogs under licence from the Moscow-based export agency Medexport.

The Norwegian production is targeted for export to Western Europe. Medexport already exports the vaccine to COMECON countries. Production of the vaccine is being carried out at Biovet's facility in Overhalla. According to Euremix director, Terje Wulff: "The reason production was placed here is that Norway has neither rabies nor foot and mouth disease, or other contagious diseases and the risks of infecting medicines are therefore much reduced."

IMPORTED ANALYTICAL INSTRUMENTS
AVAILABLE EX-STOCK

1. SHIMADZU UV-VIS SPECTROPHOTOMETER
2. SHIMADZU HPLC SYSTEMS
3. BROOKFIELD VISCOMETER
DIGITAL & DIAL READOUT
4. PERKIN ELMER GAS CHROMATOGRAPH
MODEL - 8700
5. PERKIN ELMER FTIR SPECTROPHOTOMETER

Contact: Mr. N.K. Darji

M.J. EXPORTS LTD.

113, Jolly Maker Chambers No. 2, Nariman Point, Bombay - 400 021.
Phone: 2020644 (7 lines) * Fax: (22) 2048030
Cable: SYNEXPORT
Telex: 11-4677 MJAY IN * 11-2478 MJAY IN * 11-4810 MJAY IN

# Environment

## WEST GERMANY PLANS TO BAN CFCs FROM 1995

West Germany is to ban production and distribution of gases suspected of destroying the ozone layer (CFCs, halon gases and carbon tetrachloride) from 1 January 1995. A programme has also been introduced under which the use of CFCs will be banned when alternative products are available. This will apply to aerosols and synthetic packaging with effect from 1 January 1991.

These measures go beyond the provisions of the Montreal Protocol, which requires a 50 per cent reduction in CFC usage by the year 2000. West Germany is expected to raise the possibility of a worldwide ban on CFCs from 1997 at the follow-up meeting to the Montreal convention.

At EC level, the Commission has proposed that all member states should ban CFC production and distribution from 1997. The Environment Council was to review draft conclusions on the revision of the Montreal Protocol.

### Weakening effectiveness

Elsewhere, fears have been expressed that moves by the US might weaken the effectiveness of the Montreal Protocol. At a United Nations environment conference in Bergen, Norway, during May 90, the country's delegation was reluctant to support a commitment to provide funds to help developing countries meeting their pollution reduction targets.

Industry representatives at the conference expressed the view that recent discussions with environmentalists represented a genuine breakthrough. "It seems incredible, but it's real", Shell's international environment negotiator, Peter Bright, is quoted as saying. In general, industry is no longer thinking in terms of fending off the idea that fundamental changes in technology will be needed. Instead, it is said to be defending its position with the aim of keeping a "level playing field" and rules which work.

At the Bergen meeting, Norwegian government proposed the setting up of an international green monitoring process. This would be comparable to that for arms control inspections, or to the monitoring which Organisation for Economic Co-operation and Development (OECD) members undergo. The UK did not support this proposal, but suggested that the international data base of environmental information due to be set up within the EC should also cover Eastern Europe and North America.

Japanese industry has reacted surprisingly rapidly to calls for a global reduction in the use of CFCs, following initial reluctance to move in this direction, according to a recent report in the Financial Times. More than 50 per cent of the country's usage of such products is for cleansing agents in semiconductor manufacturing. In contrast, Europe and the US use CFCs mainly in aerosols and as coolants. It is especially hard to find substitutes for the type used in Japan CFC 113.

As a result, the Japanese Ministry of International Trade and Industry was initially unwilling to introduce measures to cut CFC usage, fearing that this might damage the semiconductor industry. It therefore came as a surprise when the country agreed last year to proposals made at an environment conference in London to ban the use of CFCs within ten years. Prior to making this commitment, Japan accounted for around 40 per cent of global consumption of CFC 113.

Since then, all major Japanese companies which use CFCs have put forward plans to phase out their use, according to the report. The main semiconductor and electronic equipment manufacturers aim to stop using CFCs by the mid-1990s. The computer printer company, Seiko Epson plans to eliminate CFCs from its manufacturing process by 1993, and is said to have reduced its use of these products by half last year to 700 ton from a 1988 figure of 1400 ton. It intends to cut usage to 3350 ton this year.

Cost-effective recycling of CFCs could "virtually eliminate" their consumption in the UK by 1997 according to a report published. Commissioned by the UK Department of Trade and Industry, the report notes than halon fire extinguishers could also by recyled and the "vast majority" of their use stopped by the year 2000. The UK reduced its consumption of CFCs by half between 1986 and 1989.

### Reduction measures

The report's authors, consultants firm Coopers & Lybrand Deloitte, Mott MacDonald and C S Todd Associates suggest a number of cost-effective ways of reducing CFC usages.

The rigid foam industry could lower its dependence on controlled CFCs by changing to the HCFCs and HFCs currently in development, and by use of alternatives to CFC blown foams. The refrigeration industry users and services could reduce their usage of CFCs in the shorter term through improved maintenance procedures and recovery and recycling. Over the longer term they could change to alternative refrigerants and redesign equipment.

Fire extinghisher servicing and testing could be improved to cut emissions and recovery and recycling opportunities could be developed to cope with th declining supply of halons, and alternative products could be used.

## CBI ARGUES FOR "GREEN" AUDITS BY UK COMPANIES

The UK Confederation of Britis Industry (CBI) is urging companies make a regular appraisal of the effec the activities on the environment, in policy statement published recently. the statement, entitled Narrowing the ap — Guidelines for Business on nvironmental Auditing, the CBI notes at companies "must not wait for strictive legislation to bring about nange". This represents the strongest ndorsement yet from the organization or environmental auditing.

The statement points out that while nany companies have a good environnental record, "there is a gap between vhat a business could sometimes do to educe its impact on the environment nd what it actually does, which could e closed with better information and nstruction".

The suggested audit should include all emissions to air, land and water. It should cover legal constraints, effects on the neighbouring community, landscape and ecology, and the public's perception of the operating company in the local area, the CBI notes. This type of assessment is currently more common in the US than in Europe.

Benefits to companies carrying out this type of audit are listed by the CBI as follows: cost savings can be made by safeguarding the environment; employee awareness of corporate environmental policy is increased, and staff morale and commitment to quality can be boosted. In addition, the audit can be used to provide an environmental database to help in management decision-making, and may enable management to set targets and give credit for "good environmental performance".

The process "should not be thought of as a mere 'green-washing' PR exercise, although done well it could considerably enhance a company's public image", according to Andrew Blaza, head of the CBI's environmental management unit.

## EUREKA ENVIRONMENTAL PUSH

The European Eureka programme has increased its commitment to developing environmental protection technologies. Earlier in June, 37 projects costing ECU 253m ($309m) were approved in this sector, along with 54 other projects, giving a total investment of ECU 964m. Other sectors covered include biotechnology (nine projects, ECU 96m), new materials (five projects ECU 36m), and energy (two projects, ECU 27m).

A total of 20 UK organisations will participate in 13 of the 91 new projects, bringing the country's total involvement to 186 organisations and 95 projects. To date, no East European countries have applied to join the Eureka initiative, which aims to encourage Pan-European collaboration on high-technology R & D. Moves to encourage their participation are planned, however. The current membership of Eureka comprises 12 EC member states, six EFTA countries and Turkey. Since its launch five years ago, the programme has initiated 386 projects with a total budget of ECU 7.8 bn. Around one-third of this sum is provided by governments; the remainder comes from the private sector. France participates in the largest number of projects, at 163 followed by Italy (132) and West Germany (129).

## ROHM AND HAAS RESIN USED FOR UK WATER

Rohm and Haas' nitrate-selective ion-exchange resin, Imac HP-555, is currently being used in the first fully-operational plant using this process to treat mains water in the UK. The resin is being used by the Eastern Division of Anglian Water Services to treat Wighton borehole water in North Norfolk, according to Rohm and Haas.

Imac HP-555 is a high-purity grade of Rohm and Haas' nitrate-selective resin, Duolite ES-196. It was approved by the UK Department of the Environment under the country's 1989 Water Act. Imac HP-555 has been used in industry for several years to reduce the nitrate levels in water used in soft drinks and other food-related processes.

SCREEN PRINTING ON DRUMS & BARRELS
ANYWHERE IN INDIA
Shweta
ENTERPRISES
SCREEN PRINTING ON ANY SURFACE
SPECIALISTS IN M.S., HDPE DRUMS & BARRELS,
SIGN BOARD & BANNER PAINTERS,
COMMERCIAL DESIGNERS
S. Road, Thakurdwar, Bombay-400 002. Phone: Office: 252357 C/o. 299348 Resi.: 524633

# Technological Scene Abroad

## W, COMMTECH LICENSING GREEMENT

Dow Chemical has licensed world-ide manufacturing and marketing ghts to CommTech International's 3Z family of high-performance pol-ners. Dow already had exclusive ghts to commercialise PBZ products the Western Hemisphere. Under the revious agreement, Dow operated a emonstration plant for the production f limited quantities of PBO fibre.

PBZ products are described by CommTech, based in Menlo Park, Cali-ornia, as liquid crystalline, rigid rod polymer compositions including poly-benzobisoxazole, with high molecular weight and concentration. They can readily be formed into films and individual items, in addition to the usual fibre configuration, according to the company. PBZ products are said to have exceptionally high tensile strength and stiffness together with resistance to moisture, heat and ultra-violet exposure. The latest agreement between Dow and CommTech follows a joint development programme for the family of products, which started in 1986.

## OXFORD/H-P PACT

Oxford Molecular, a company set up by the University of Oxford's technology transfer unit, has formed a strategic business partnership with Hewlett-Packard to target the molecular modelling market, projected at $24m worldwide by 1991. The companies aim to provide advanced molecular modelling solutions, starting with the joint development of Oxford Molecular's Pimms system on HP work-stations.

The partnership plans to give users easy access to "robust, state-of-the-art" modelling techniques. The Pimms system "will offer such facilities at a fraction of the current market price, thus making molecular modelling a commodity computer application". The project is expected to be completed towards the end of 1990.

Oxford Molecular has also reached two separate agreements with Glaxo Group Research and British Biotechnology, under which the companies will have rights to use all of Oxford Molecular's products for an unspecified sum of money.

## ICI IN JOINT COMPOSITES TESTING

In the US, ICI Advanced Materials and Southwest Research Institute (SwRI) of San Antonio, Texas have begun a testing programme to evaluate the fire, smoke, toxicity and corrosive performance of polymeric composite materials and systems used in aircraft interiors, naval vessels, mass transit vehicles and construction materials.

The first phase of the project involves the evaluation of SwRI of a series of thermoset and thermoplastic composites to establish baseline performance data. The composites for this phase were selected on the input of information from potential users. In Phase II, the composites will be protected with fire barrier materials including WR Grace's Microlite vermicullite dispersion and ICI's recently introduced Ceepree glass frit filler. SwRI will remeasure the fire performance characteristics for comparison with unprotected materials.

ICI has a long-term supply agreement with Grace for Microlite, a layered mineral primarily used to coat fibres and fabrics from an aqueous solution. Ceepree is generally compounded into a host resin system but can also be used as an adhesive or a coating. After evaluation of small scale samples, large structures and systems will be fabricated using the best and most cost effective system as determined in Phase II and tested under full fire conditions for specific applications to verify the small scale test results. The project, which is already underway, is expected to last 18 to 24 months.

FOR YOUR REQUIREMENTS OF

HYDROBROMIC ACID 48%
N-PROPYL BROMIDE
ISO AMYL BROMIDE
TETRAHYDROFURAN (Recovered)
DIMETHYL FORMAMIDE (Recovered)
CELLOSOLVE (Recovered)

METHYL FORMATE
METHYL ACETATE
ISOPROPYL ACETATE
ETHYL FORMATE
METHYLAL
ISOAMYL ALCOHOL (128°-132°C)

Please Contact:

M/s. SHREE CHEM INDUSTRIES

2/4, Kubal Niwas, Gokhale Road (N), Dadar, Bombay 400 028.
Tel: 4300266 & 456868

* We also undertake distillation jobworks.
* We also buy Surplus, Crude, Spent & Waste Solvents & Chemicals.

# News about New Projects

## GERIA CONFIRMS PORT ARCOURT CONTRACTORS

Japan's Chiyoda Corp, Kobe Steel d JGC Corp and Italy's Tecnimont ve signed contracts worth over $1bn th the Nigerian National Petroleum orp's Eleme Petrochemicals subsidi- y for the three units of the long- vaited petrochemicals complex at Port arcourt.

The Nigerian government is under- ood to have secured the necessary xport credit guarantees to cover loan nancing, allowing work at the complex proceed. Letters of intent were signed vo years ago.

Under the contract agreements, Chiy- da is to build the olefins plant, Kobe teel the polyethylene unit and GC/Tecnimont the polypropylene unit. he olefins plant will be based on Kel- ogg's Millisecond technology, the pol- ethylene unit will use Du Pont Canada's technology and the polypro- ylene unit Himont's technology.

The olefins plant will be capable of producing 300,000 ton/year ethylene and 90,000 ton/year propylene. The polyethylene unit and polypropylene plant will have capacities of 250,000 ton/year and 80,000 ton/year, respectively. Also included is a 22,000 ton/year butene-1 plant.

Project implementation will be managed jointly by Eleme Petrochemicals and Foster Wheeler International of Reading, UK, which has acted as managing consultant to the project since 1981.

The ministry of petroleum resources in Lagos says production of polyethylene and polypropylene will be adequate to meet foreseen local demand.

The ministry says it has concluded export marketing agreements with Du Pont Canada for 150,000 ton/year polyethylene and with Technic International of Italy for 40,000 ton/year of polypropylene.

According to the ministry, the contractors have undertaken to hand over a mechanically completed complex within 33 months from the effective date of contract. Under these terms, the units are now expected onstream early 1993.

The three units represent the first stage of the complex — a second stage is planned, though no units have yet been finalised. Go-ahead for the investment was given by the Nigerian government back in 1984. The complex then valued at $2bn, included 12 process units.

## ICI DECISION ON CANDID SOON

A decision on whether to invest in the new Candid technology as part of the nylon chain at Wilton, UK will be made by the ICI board within the next couple of months, ICI Chemicals & Polymers ceo Dick Lindsell said.

Candid, an alternative acrylonitrile-based route to the nylon intermediate adiponitrile, has been under development for several years. A pilot plant is in operation successfully, Lindsell said.

If the project goes ahead, it will replace the existing adiponitrile plants and associated adipic acid and nitric acid capacities at the Wilton complex.

ICI staff have expressed concern over the perceived delay in sanctioning Candid. The ICI board recognised the need to upgrade the nylon chain in the UK, but Candid was only one of three options, Lindsell said. The others involve upgrading the existing plants or buying in adiponitrile to supplement current production.

## PEMEX/MITSUI STUDY AROMATICS COMPLEX

Pemex, Mexico's state-owned oil company, is to cooperate with Japan's Mitsui to study the possibility of building a new aromatics complex in the north-eastern state of Nuevo Leon.

If the study proves encouraging, Pemex hopes to build a $354m plant to manufacture benzene, paraxylene and orthoxylene. Mitsui may help with financing, though investment by the Japanese firm is understood to have been ruled out. Other outside finance is likely to come from Mexican banks and private companies.

Sources suggest the plant would process 25,000 barrel/day of naphtha to manufacture 580,000 ton/year aromatics and 366,000 ton/year of low-grade products such as low-octane gasoline.

## CYANAMID EXPANDS SOLUTION ACRYLAMIDE

American Cyanamid is to increase its solution acrylamide production capacity by 25 per cent by expanding facilities in the US and Europe.

The expansions will take place first at Botlek, the Netherlands, and then at the Fortier plant near New Orleans. Completion is set for the first quarter of 1991.

The company says expansion is to meet increasing global demand. No production figures were released.

Acrylamide products are primary ingredients in polymers used for water and waste treatment. They are also used in paper manufacturing, to retain paper strength and to improve sheet and processing quality, and in mineral ore and coal processing.

# News From Japan

## MITSUBISHI KASEI TO ADD OXO-ALCOHOL PRODUCTS

Mitsubishi Kasei Corp. is scheduled to increase in the summer of next year its production capacity for oxo-alcohol products (2-ethylhexanol, normal butanol, iso-butanol and high alcohol) from the current level of 226,000 t/y to 300,000 t/y at its Mizushima factory (Okayama Prefecture). New-type rhodium catalysts will be employed for the planned capacity build-up.

Demand for oxo-alcohol products is steadily increasing throughout the world for use in plasticizers. With regard to raw-material supply, the company plans to scale up production of ethylene and propylene — both raw materials for oxo-alcohol products — from the present 400,000 t/y to 450,000 t/y at the same factory when periodic repairs are conducted on their plants next year.

The company has commanded an overwhelmingly large market share in Japan for oxo-alcohol products using unique production technology. The planned plant expansion will help further consolidate its position as the largest supplier of the products. They are key commodities for the company's international operations. The company inaugurated in 1978 commercial production of 2-ethylhexanol at the Mizushima factory using oxo-reaction technology based on a rhodium process. The technology ensures a high yield ratio for aldehyde under moderate reaction conditions and serves to save on energy consumption. It has been awarded many technical prizes.

## BRISK INQUIRIES FOR POLYESTER MATERIAL COME FROM ROK, TAIWAN

The supply-and-demand situation for polyester materials in Japan is showing rapid recovery. With the improvement of the environment surrounding export of polyester staple fiber to China and other countries in the background, the operation rate among the textile manufacturers of Taiwan and ROK, who had continued to cut production from last year, is rising rapidly. As a result, the demand for both high-purity terephthalic acid (PTA) and EG is increasing conspicuously.

In the case of EG, in particular, it is thought that the curtailment of stockpiles by users has been completed, for the present. So, requests have been made in succession, mainly from ROK and Taiwan, to Japanese manufacturers for expansion of exports.

Because of such a situation, Mitsui Petrochemical Industries, which has been planning to cut production substantially by means of periodic repairs to be carried out over a long time, has begun to check into the possibility of starting operation with the completion of periodic repairs in mid-June. Thus, production of polyester materials, which had remained stagnant from the second half of last year, had suddenly begun to show signs of recovery.

It was clear that the supply-and-demand situation concerning polyester fiber had eased in the second half of last year, with the worsening of the economic situation in China — one of the major purchaser nations — from the second half of 1988 in the background. As a result, Taiwan and ROK, the main exporter countries, began to cut production by an average of 20 to 30%.

Since February this year, however, exports to China have been recovering rapidly. Even exports to Taiwan alone amounted to 4,000 tons in February and 9,000 tons in March. Exports to other areas, too, have increased greatly. Consequently, manufacturers in Taiwan, where stockpiles have decreased sharply, are already in a state of full operation. ROK, too, is expanding polyester-fiber production at a great tempo. Because of these circumstances, demand for both PTA and EG has been recovering conspicuously since April. Particularly in case of EG, stockpile reduction has made progress in ROK and Taiwan. As a result, a supply shortage has come to be felt temporarily, and Japanese manufacturers have been requested to expand exports. The supply-and-demand situation concerning polyester materials is changing rapidly now.

However, not a few circles doubt whether the present situation will continue for long. In the case of PTA, in particular, it is expected that supply capacity will be increased by 460,000 tons in ROK and 450,000 tons in Taiwan within this year. Also, in Japan, a plant belonging to Mitsui Petrochemical Industry, which has a supply capacity of 250,000 tons, is scheduled to go into operation in July. So, it is expected that supply will far exceed demand in the not-too-distant future.

## NINE CHEMICAL/SYNTHETIC TEXTILE FIRMS GAIN UNPRECEDENTED PROFITS IN MARCH

The business records of Japan's chemical and synthetic-textile manufacturers remain favourable. The nine major chemical and synthetic-textile manufacturing companies, including Asahi Chemical Industry, Toray Industries, and Teijin, had settled their annual accounts for the period ending March 1990 by May 23. It has become clear that the profit-making capacity of the textile sector has improved, with increasing demand for filament in the background. Also, the "multilateral" sector continued to grow steadily. As a result, many manufacturers recorded unprecedented profits in succession. However, it is expected that the tempo of profit expansion will slow down in the year up to March 1991, because of the rise in the cost of raw fuel due to the decline of the yen's exchange rate and the stagnation of textile production.

The textile sector, which became extremely inactive due to the rise of the yen's exchange rate after the last G5 meeting, has recovered completely. In the case of polyester filament, demand for materials for high-class clothing, which is called "new synthetic fiber", and demand for industrial materials, such as those for car seats, were brisk.

Also active was demand for synthetic filament, such as nylon filament used for stockings and other items. These demands were helpful for the recovery of the textile sector. In the textile sector, Teijin was able to earn 50% (as compared with 40% in previous period) of its regular profits, and Toray Industries 40% (as compared with 30% in previous period).

In addition, acrylic staple fiber, which had attracted little demand until the previous period, has begun to show signs of recovery. Inventory adjustment has been carried out by means of production curtailment, and production costs have been reduced as a result of rationalization efforts. Furthermore, exporting to China has been resumed, and the tempo of importation of manufactured goods has begun to decline due to the fall of the yen's exchange rate. As a result, the environment surrounding is improving. Both Mitsubishi Rayon and Asahi Chemical Industry, which are highly dependent on acrylic fiber, have recorded profit increase.

The ratio of the sales of the multilateral sector — involved with plastics, medicines and others — to the total sales is rising steadily. Kuraray, which has absorbed Kyowa Gas Chemical Industry, has recorded a ratio of 48.8%, or eight points higher than that in the previous period. The ratio is expected to rise to nearly 60% in the present period.

Asahi Chemical Industry continued to record ratios higher than 80% for the second consecutive year. In the case of Toray Industries and Teijin, too, the ratio is rising slowly. In the multilateral sector as well, however, the profit rate is declining in the case of such items as polyester film and multipurpose resin. This is a cause of anxiety about the future.

**Results of March Settlement of Accounts of Eight Major Synthetic Textile Companies**
**(In ¥ million)**

| Companies | Sales | Ordinary profits | After-tax profits |
|---|---|---|---|
| Asahi Chemical Industry | 879,307 | 75,366 | 33,235 |
| | (7.5) | (4.8) | 18.3) |
| Toray Industries | 549,140 | 55,363 | 31,400 |
| | (-0.7) | (6.0) | (82.0) |
| Toyobo | 328,751 | 14,570 | 7,329 |
| | (4.2) | (2.5) | (1.4) |
| Teijin | 305,669 | 39,886 | 21,361 |
| | (-2.1) | (11.9) | (22.2) |
| Unitika | 264,470 | 8,703 | 3,383 |
| | (5.9) | (8.1) | (19.2) |
| Mitsubishi Rayon | 257,918 | 12,851 | 5,642 |
| | (28.8) | (40.3) | (28.7) |
| Kuraray | 234,205 | 15,302 | 7,326 |
| | (11.0) | (47.7) | (172.7) |
| Toho Rayon | 74,149 | 1,801 | 737 |
| | (4.4) | (14.9) | (12.1) |

Note: Parenthesized figures show comparison with corresponding period of previous year as percentage.

## ISHIHARA INTENDS TO DOUBLE AGROCHEMICAL SALES BY 1995

Ishihara Sangyo Kasei Ltd., intends to substantially expand its agrochemical business by means of the new products it has developed in the last few years and will begin marketing within two to three years. The company has been building up its lineup of insecticides, fungicides and herbicides with market potential and is working on a plan to double the sales of its agrochemicals by 1995 by increasing their shares in both domestic and foreign markets.

Among the chemicals Ishihara has developed in recent years, "Atabron" insecticide, "Frowncide" fungicide are a new sulfonylurea-based herbicide and believed to have good market potential. Atabron marketed in 1988 and Frowncide to be marketed next fertilizer year have a wide application range and excellent properties.

The herbicide (development code: SL-950) featuring high selectivity and a great weed-killing effect will be put on Western markets as a herbicide for corn fields in a few years. Frowncide is expected to grow into a big-seller item earning ¥4-5 billion a year. In overseas markets, "Onecide" herbicide for use on fields and noncropland and Atabron insecticide have been enjoying good sales. Onecide technology has been licensed to European and American makers. Onecide sales in the Asain region out side of Japan reach about ¥6 billion a year, accounting fo 50% of Ishihara's total agrochemical exports. Its sales there are likely to move up further. It seems that SL-950 will be marketed in the EC in or after 1993 and create a big market there. It is now undergoing farm tests in more than 20 countries

## ATTENTION . . . . . . . .

*Manufacturers having expertise in handling bulk Nitration*

**HERE** *is a golden opportunity . . . . . .*

**Our client in USA needs**

# 4-NITRO-O-XYLENE

## (3,4-Dimethylnitrobenzene)

Annual Requirements : 350 MT/year

**(Irrevocable revolving L/C will be established in your favour)**

Interested parties, please contact with price idea, quantity offerable for Exports, packing & detailed specifications to

**Box No. 1264**
**CHEMICAL WEEKLY**
306, Shri Hanuman Industrial Estate, G.D. Ambekar Road, Wadala, Bombay 400 031

---

We are one of the leading Exporters of Reactive Dyes.
We need the following items for our Exports

**BLACK HN -- REACTIVE BLACK - 8**

**ORANGE H2R -- REACTIVE ORANGE - 13**

**BLACK B -- REACTIVE BLACK - 5**

**TURQ. BLUE H5G -- REACTIVE BLUE - 25**

**RED H8B -- REACTIVE RED - 31**

**RED M5B -- REACTIVE RED - 2**

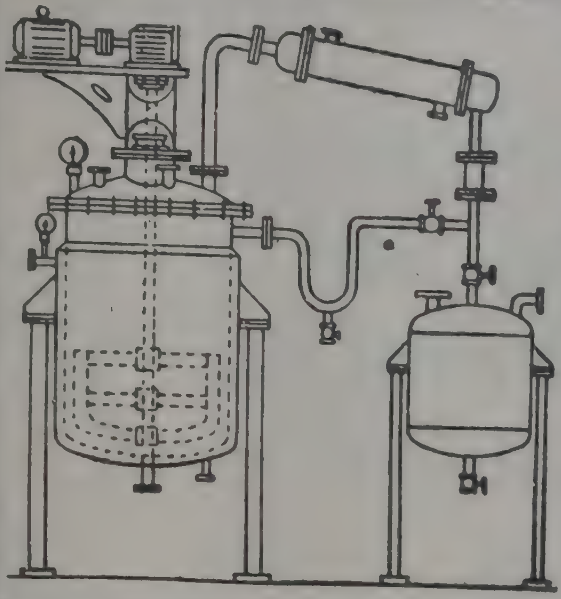
**TURQ. BLUE G -- REACTIVE BLUE - 21**

Please contact us with your sample and lowest price at

**Box No. 1265**
**CHEMICAL WEEKLY**
306, Shri Hanuman Industrial Estate,
G.D. Ambekar Road, Wadala, Bombay 400 031.

---

This space
will cost you
Rs. 1,000 only



For your requirement of

- REACTION VESSEL
- CONDENSORS
- STORAGE TANKS
- PRESSURE VESSELS
- COLUMNS/RECEIVERS
- HEATING UNIT

We design and fabricate the above and any type of equipments in S.S./M.S./M.S. Rubberlined/Lead Bonded. We also undertake the erection and commissioning of the complete plant.

**KRISHNA ENGINEERING CORPORATION**

**Office:** 49, Kailash Apartment No. 3, Rambaug, S.V. Road,
Behind Himalaya School, Borivli (West), Bombay 400 092.

**Factory:** Bhayandar (East), District Thane.

**Phones: O/R. 6060632 Factory: 6982830**

YOUR SOURCE OF ESSENTIAL OILS AT MOST COMPETITIVE PRICES
LIKE

**ANETHOL**
**BREGAMOT OIL**
**CEDARWOOD OIL**
**EUCALYPTUS OIL**
**LEMON OIL**
**ORANGE OIL**
**PEPPERMINT OIL**
**ANITHEE OIL**
**CASSIA OIL**
**CARAWAY OIL**
**GERANIUM OIL**
**LAVENDER OIL**
**OIL MENTHA PIPERITA**
**ROSEMARY OIL**
**ANISE OIL**
**CELERY SEED OIL**
**CLOVE OIL**
**JAMROSA OIL**
**OIL YLANG YLANG**
**NUTMEG OIL**
**SPEARMINT OIL**

*and many more*
CONTACT

**HARIPRABHA ENTERPRISES**

14/A, Nirmala Niwas, Sion (E), Bombay 400 022.
**Telephone: 409 3899, 298691 * Telex No. 011-3968 HARI IN**

**BIOCHEMICAL AND SYNTHETIC PRODUCTS LTD.**

For your requirements of the following drugs and biologicals, please contact us at the address given below:

**BULK DRUGS**

PAS Sodium Powder • PAS Acid • Ethopabate • Metoclopramide • Trimethoprim I.P. • Amprolium Hydrochloride BP (Vet) • Rifampicin IP/BP • Methyl Paraben Plain and Sodium • Propyl Paraben Plain and Sodium • Aspirin BP/USP • Salicylic Acid.

**BIOLOGICALS**

Bacteriological Peptone • Liver Fraction I/II NF • Liver Concentrate Paste 1:20/1:40 • Liver Concentrate Powder Prot. Liver Extract 1:12/1:20 • Prot. Liver Powder 1:20 • Beef Extract Paste • Beef Extract Powder • Ox Bile Extract • Ox Bile Salt • Prot. Meat Extract 1:10 • Ovalecithin • Egg Albumin Flakes • Desiccated Liver • Yeast Extract • Yeast Extract Powder • Veg. Protein Hydrolysate • Extract Glycyrrhiza Concentrate • Extract Senega Concentrate • Ginger Oleoresin • Deglycyrrhizinised Liquorice • Prot. Stomach Extract 1:10 • Prot. Heart & Lung Extract • Prot. Spleen Extract • Dimethyl Hydroquinone • Papain IP/BP • Ox Bile Extract - NF • Ox Bile Salt - BPC • Mono-Ammonium Glycyrrhizanate.

Prices will be Furnished on request.

**C/o. Neo-Pharma Private Limited**
Kasturi Bldgs., 5th Floor, J. Tata Road, Bombay 400 020.
**Tel. No. 202 6613 / 202 7663 / 202 1764 * Telex No. 011-84182**

For Your Requirements Of:

**META DI NITRO BENZENE**
**META NITRO ANILINE**
**META AMINO ACETANILIDE**
**4 NITRO 2 AMINO PHENOL**

CONTACT MANUFACTURERS

**Mangalam Organics Pvt. Ltd.**

Regd Office 292, Princess Street, 2nd Floor, Near Flyover Bombay-400 002
Gram: DHOOTUDYOG • Phones 317969 • 317411 • 317489 Telex 011-4643 MRPL IN

Factory Plot No 1203, G I D C VAPI Dist. Valsad Gujarat. Phone 930 Telex 183 256 SMPL IN

AVAILABLE SPECIALITY AUXILIARIES

**KVS (Cross Linking Agent)**
**MBX (Finishing Agent for Synthetics)**
**AMINO SILICONE EMULSION**
**CATIONIC SOFTENERS**

Please Contact the Manufacturers

**DYNAMIC CHEMICAL CORPORATION**

ADMN. OFFICE: 195, DR. D.N. ROAD, G.P.O. BOX NO. 1021, FORT, BOMBAY - 400 001.
PHONE: 2611192

# MARKET INFORMATION

## Activities Low, Price of Solvents, DEG likely to firm

On account of the festival season trading activities remained low. In the chemicals section sodium nitrite went up to Rs. 1,300. Diethylene glycol continued to be in short supply and prices are expected to go up. With the Iraq situation being what it is prices of solvents are likely to move up. In the dyes intermediate section dihydrothio PTOS went up to Rs. 1,500 following acute shortage and high import bookings. Cyanuric chloride also went up by Re. 1 to Rs. 158.

**We cannot guarantee the accuracy of the prices published in CHEMICAL WEEKLY as they are based only on the enquiries made by our correspondent -- and, as such they are not FIRM PRICES as between a buyer and seller. The prices are published only with a view to giving some ideas of the market conditions.**

**The prices are inclusive of Excise and Maharashtra Sales Tax.**

**(Prices as on August 13, 1990)**

| INDUSTRIAL CHEMICALS | Per Kg. |
|---|---|
| Ammonium sulphate | 2.50 |
| Ammonium phosphate (Mono) | 14.50 |
| Ammonium phosphate (Di) | 14.50 |
| Ammonium carbonate (Di) | 17 00 |
| Ammonium bicarbonate | 6.00 |
| Ammonium chloride | 3.25 |
| Ammonium nitrate | 6.00 |
| Arsenic white powder | 22+ST |
| Acrylamide (Resale) | 77 00 |
| Barium carbonate | 20.00 |
| Bleaching powder (33% Cl) | 5.00 |
| Borax (Granular) | 16 00 |
| Borax (Powder) | 22.00 |
| Boric acid (Tech) | 32.00 |
| Bisphenol-A | 75 00 |
| Butyl carbitol | 106 00 |
| Caustic soda (Flakes) | 11 50 |
| Caustic soda (Solid) | 12 00 |
| Caustic soda (Lye) | 10 00 |
| Calcium chloride 70% (Solid) | 3 25 |
| Calcium chloride 75-80%(fused) | 3.50 |
| Calcium chloride 36% (Anhydrous) | 5.00 |
| Calcium carbonate (precipitated) | 6 00 |
| Calcium carbonate (Activated) | 5 75 |
| Cobalt oxide | 550 00 |
| Cresylic acid | 62.00 |
| Camphor (Indian) | 105.00 |
| Cream of Tartar (Tech ) China | 70 00 |
| Citric acid (Belgium) (Resale) | 47 00 |
| Citric acid (Indian) (Resale) | 41 00 |
| Copper sulphate | 24 00 |
| Chromic acid | 63 00 |
| Ethylene urea | 58 00 |
| Ferric chloride (Lumps) | 9 00 |
| Ferric chloride (Anhydrous) | 20 00 |
| Glue flakes | 15 00 |
| Glue sheets | 6 75 |
| Gohsenol GH-17 | 128 00 |
| Hydro | 39+ST |

Paints, Pharmaceuticals, Pesticides & Chemicals
Manufacturers for your Requirements of

NOCIL PRODUCTS

ACETONE
DIACETONE
ISOPROPANOL
N-BUTANOL
M.I.B.K.
IPA-CBM

ISOBUTANOL
E.D.C.
2-ETHYL HEXANOL
P.E.G. 200/300/400/600/1500
M.E.G.
D.E.G.

Please Contact: Authorised Distributors for Gujarat State.

SHREE AMBICA TRADING CORPORATION

**Bombay Office:**
813, Raheja Centre, 214, Nariman Point,
BOMBAY - 400 021
**Phones: 240415/243979/2873680**
**Telex: 011-6053 SATC-IN**

**Ahmedabad Office:**
4A-B, Trade Centre, Near Stadium House,
Ahmedabad-380 014
**Phone: 462332/440084**

| | |
|---|---|
| Hyflosupercell | 28.00 |
| Hexamine (Resale) | 36.00 |
| Industrial Wax | 25.00 |
| Litharge | 40.00 |
| Lead Acetate (Tech.) | 39.00 |
| Lithopone | 32.00 |
| Magnesium chloride (Crystal) | 2.00 |
| Menthol crystal (Flakes) | 355+Ex+ST |
| Menthol bold | 425+Ex+ST |
| Menthol crystal cold | 395+Ex+ST |
| Magnesium carbonate (Japan) | 30.00 |
| Magnesium carbonate (Indian) | 26.00 |
| Maleic Anhydride (Resale) | 42.00 |
| Mercury (34.5 Kgs) | 11,500.00 |
| Nickel chloride | 110.00 |
| Oxalic acid (Resale) | 15.00 |
| Peppermint oil (Rectified) | 188+Ex+ST |
| Potassium carbonate (Indian) | 28.00 |
| Potassium carbonate (Imported) | 32.00 |
| Potassium bichromate | 38.00 |
| Potassium phosphate (Mono) | 34.00 |
| Potassium phosphate (Di) | 25.00 |
| Polyvinyl alcohol (No. 117) | 93.00 |
| Polyvinyl alcohol (No. 173) | 135.00 |
| Polyvinyl alcohol (No. 208) | 170.00 |
| Paraformaldehyde (Resale) | 20.50 |
| Phthalic anhydride (Resale) | 34.00 |
| Pentaerythritol (Resale) | 49.00 |
| Paraffin wax | 22+ST |
| Rangolite (German) | 96+ST |
| Rangolite (Czech.) | 72.00 |
| Rangolite (China) | 54.00 |
| Sodium sulphate (Fine) | 3.75 |
| Sodium sulphate (Coarse) | 3.50 |
| Sodium sulphide 50-52% (Flakes) | 11.50+ST |
| Sodium sulphide 58-60% (Flakes) (TCL) | 25.00 |
| Sodium sulphide pure (Flakes) | 12.25 |
| Sodium nitrite (Resale) per 50 kg. | 1,300.00 |
| Sodium chlorite 80% (Spain) | 100+ST |
| Soda Ash (Tata) | 5.40 |
| Soda Ash (Birla) | 5.25 |
| Soda Ash (Imp.) | 5.00 |
| Sodium bicarbonate | 7.00 |
| Sodium bisulphite | 8.00 |
| Sodium silicate | 5.50 |
| Sodium acetate | 7.20 |
| Sodium alginate | 450.00 |
| Titanium Dioxide (Anatase) | 65.00 |
| Titanium Dioxide (Rutile – $RCR_2$) | 88+ST |
| Tartaric acid | 190.00 |
| Trisodium phosphate | 12.00 |
| Thiourea | 78.00 |
| Urea (Tech.) | 3.00 |
| Vacuum salt | 1.00 |
| Zinc Dust | 52.00 |
| Zinc Oxide | 54.00 |
| Zinc chloride powder (Tech.) | 20.50 |
| Zinc sulphate | 7.00 |

| SOLVENTS | Per Kg. |
|---|---|
| Acetic Acid Glacial (Resale) | 13.00 |
| Acetic Anhydride (Resale) | 33.50 |
| Acetone (Resale) | 19.00 |
| Adipic Acid | 90.00 |
| Aceto Acetanilide | 55.00 |
| Aniline Oil (HOC) | 46.00 |
| Benzoate Plasticiser | 62.00 |
| Butyl acrylate | 75.00 |
| Butyl stearate | 38.00 |
| Butanol | 32.00 |
| Benzyl Alcohol | 60.00 |
| Benzyl Chloride | 34.00 |
| Benzo trichloride | 16.00 |
| Benzoyl chloride | 22.00 |
| Bromine Liquid | 68.00 |
| Chloroform | 30.00 |
| Carbon Tetrachloride | 20.00 |
| Cellosolve | 58.00 |
| Cyclohexanone | 64.00 |
| Cyclohexanol | 58+ST |
| Diacetone (Resale) | 26.75 |
| Diethyl Oxalate | 34.00 |
| Diethyl glycol (DEG) | 25+ST |
| Dioctyl Phthalate | 44.00 |
| Diallyl Phthalate | 41.00 |
| Dimethyl Phthalate | 28.00 |
| Dioctyl Adipate | 52.00 |
| Dibutyl Adipate | 42.00 |
| Dipentene | 15.00 |
| Dimethylamine 40% | 30.00 |
| Dimethylamine 50% | 35.00 |
| Ethyl Acetate | 15.50 |
| Ethyl Acrylate | 66.00 |
| Ethylene Dichloride | 18.50 |
| Ethylene Glycol | 32.00 |
| Formic Acid (Imp.) | 24.00 |
| Formaldehyde (Resale) | 6.50 |
| Glycerine (CP) | 55.00 |
| Glycerine (IW) | 54.00 |
| Hydrogen Peroxide 50% (Resale) | 35.00 |
| Isopropyl Alcohol | 26.00 |
| Isobutyl Alcohol (Resale) | 35.00 |
| Monoethanolamine (Resale) | 95.00 |
| Melamine | 60.00 |
| Methyl Ethyl Ketone | 36.00 |
| Methyl Isobutyl Ketone | 38.00 |
| Methyl Acrylate | 68.00 |
| Methylene Dichloride (Resale) | 16.50 |

FOR YOUR REGULAR REQUIREMENTS OF:

**Butyl Acetate**
**Octyl Acetate**
**Di Octyl Maleate**

Please Contact Manufacturers:

**VIKRAM CHEMICAL INDUSTRIES**

1218, Dalamal Tower, Plot No. 211, Nariman Point, Bombay 400,021.
**Phones: 230006, 231192, 233554, 233562**

IN GOD WE TRUST

For Excellent Quality & Regular Guaranteed Supplies at Competitive Rates:

CALCIUM STEARATE
MAGNESIUM STEARATE BP 80
ZINC STEARATE
ALUMINIUM STEARATE

COPPER SULPHATE IP
DRIED ALUMINIUM HYDROXIDE IP
MAGNESIUM HYDROXIDE POWDER IP
ZINC CARBONATE

AND OTHER LABORATORY CHEMICALS

Contact Manufacturers & Exporters:

**ARUN INDUSTRIES**

303-A, Vrindavan, Ramachandra Lane, Malad (West), Bombay-400 064.
Phone: Office: 6820559/6820422 Telex: 011-78081 ARUN IN
Gram: "DEVOTION"

WE ARE REGISTERED WITH D.G.S. & D

FOR YOUR REQUIREMENTS FROM READY STOCK

ACETONE
DIACETONE
N-BUTANOL
ISOBUTANOL
D.E.G. / E.D.C.
BENZENE / M.E.G.
M.E.K. / M.I.B.K.
TOLUENE
SODIUM FORMATE
IPA-CBM

XYLENE
(ORTHO/PARA/MIX)
SOLVENTS C-IX (CRUDE)
NITROBENZENE
FORMALDEHYDE (37% HOC)
PHENOL (LIQUID/CRYSTAL)
ETHYL ACETATE
BUTYL ACETATE
ACRYLONITRILE
(ORIGINAL/REPACK)

N-HEXANE FOOD GRADE
ANILINE OIL
FORMIC ACID (IMP)
PROPYLENE GLYCOL
STYRENE MONOMER
VINYL ACETATE
MONOMER
and all kinds of
SOLVENTS &
CHEMICALS

Please Contact:

**Hiren Chem Corporation**

306, Adamji Building, 3rd Floor, 413-Narshi Natha Street, Bombay 400 009.
Tel: 343426-333692-338139. (R) 5604922.
*Branch Office:* SHINE PHARMA CHEM
D/422-B.G. Tower, 4th Floor, Opp. Delhi Darwaza, Shahi Baug Road, Ahmedabad 380 004. Tel: 20959-24186. (R) 67003-68229

For Your Requirements Of:

Acetic Acid Glacial
Alumina Sulphate
(Iron Free) Lumps, Powder
Alumina Sulphate
(Alum) Anhydrous
Ferric Alum
Alum Lumps, Powder
Potash Alum
Ammonium Chloride
Ammonia Bicarb
Bleaching Powder
Borax Crystals, Granular
Barium Carbonate
Caustic Soda Flakes
Calcium Chloride
(Solid, Fused, Anhydrous)
Calcium Carbonate Precipitate
Citric Acid
Copper Sulphate

Ferric Chloride (Anhy)
(Lumps, Powder)
Ferrous Sulphate
Diammonium Phosphate
Glauber's Salt Coarse, Powder
Magnesium Chloride IP Grade
Magnesium Sulphate
(Crystals Technical. IP Grade)
Manganese Sulphate
Magnesium Sulphate
(Dried/Anhy)
Dextrine Yellow, White
Maize Starch
Anilose E
Oxalic Acid
Potassium Permanganate
Potassium Carbonate
Sodium Sulphide
(Flakes, Solid, Bits)

Sodium Sulphate
Sodium Bisulphite
Sodium Meta Bisulphite
Sodium Bisulphate
Sodium Acetate
(Crystal, Anhydrous)
Sodium Hexameta Phosphate
Sodium Metasilicate
Sodium Nitrate/Nitrite
Sodium Silicate
Soda Ash
Trisodium Phosphate
Tata Salt
Water Softening Agent
Zinc Chloride
Zinc Oxide
Zinc Sulphate

Please Contact: **UNION CHEMICAL AGENCY**
**TEX DYES**
231, Samuel Street, Vadgadi, Bombay 400 003. Tel.: 321462/343117 Grams:

| | |
|---|---|
| Carbitol | 72+ST |
| Meta Cresol | 45.00 |
| Nitrobenzene | 19.00 |
| Nitric Acid (Conc.) (RCF) | 2.50 |
| Ortho Cresol | 30+ST |
| Phenol (Resale) | 37 00 |
| Propylene Glycol | 52.00 |
| Polyethylene Glycol (No.200) | 50.00 |
| Polyethylene Glycol (No.400) | 65.00 |
| Polyethylene Glycol (No.500) | 52.00 |
| Polyethylene Glycol (No.1600) | 54.00 |
| Polyethylene Glycol (No.4000) | 80.00 |
| Polyethylene Glycol (No.6000) | 85.00 |
| Para Cresol | 120.00 |
| Styrene Monomer | 42.00 |
| Sorbitol | 14.00 |
| Sulphuric Acid | 2.80 |
| Trichloroethylene | 26.00 |
| Triethanolamine (Resale) | 85.00 |
| Turpentine Oil (Germany) | 8.00 |
| Turkey Red Oil (50%) | 20.00 |
| Vinyl Acetate Monomer | 52 00 |

| SOLVENTS | Per Litre |
|---|---|
| Benzene | 11 00 |
| N-Heptane | 10 50 |
| N-Hexane | 11 00 |
| Methanol | 8 50 |
| Solvent Naphtha Heavy | 10 50 |
| Solvent Naphtha Light | 8 50 |
| Toluene | 11 75 |
| Xylene | 22 00 |

## DYES INTERMEDIATES (PRICES ARE WITHOUT TAX AND EXCISE)

| | |
|---|---|
| Alphanaphthylamine | 65.00 |
| Alpha Naphthol (Imp.) | 155.00 |
| Aceto Acetic Ester (Methyl) | 65.00 |
| Ammonium Molybdate | 210.00 |
| Anthraquinone | 140.00 |
| Anthranilic Acid | 75.00 |
| 2-Amino 4-Nitrophenol | 140.00 |
| Blue B. Base (Local) | 285.00 |
| Beta Naphthol (Atul) | 71.00 |
| Benzidine Dihydrochloride (BDH) | 76.00 |
| Bromamine Acid | 445.00 |
| BON Acid (Incl. of excise) | 140.00 |
| Chicago Acid (Atul) | 350.00 |
| Coach Acid | 52.00 |
| C. Acid (Imp.) | 210.00 |
| Cyanuric Chloride | 158.00 |
| 2,4- DNCB | 27.00 |
| Dihydrothio PTOS (Imp.) | 1,500.00 |
| Dimethyl Aniline | 64.00 |
| Diethyl Aniline | 140.00 |
| Diamino stilbene disulphonic acid | 155.00 |
| 3,3-DCB (Imp.) | 200.00 |
| Gamma Acid (Atul) | 205.00 |
| H. Acid (Atul) | 95.00 |
| G. Salt | 70.00 |
| Isophthalic Acid | 50.00 |
| J. Acid | 330.00 |
| J. Acid Urea | 450.00 |
| K. Acid | 110.00 |
| MPDS (German) | 185.00 |
| MNA | 124 |
| Meta Ureido Aniline | 175 |
| MPD (Local) | 160 |
| MPD (Japan) | 180 |
| Naphthenic Acid | 46 |
| N-Methyl J. Acid | 525 |
| N-Methyl Aniline | 120 |
| Naphthalene (Refined) | 24 |
| Ortho Anisidine (OA) (Imp.) | 118 |
| Ortho Dichloro Benzene (ODCB) | 18. |
| OT Base | 125. |
| Para Dichloro Benzene (PDCB) | 28. |
| Para Anisidine (PA local) | 128. |
| PNA | 88. |
| Para Cresidine (Imp.) | 380. |
| Para Amino Azo Benzene (India) | 135. |
| PNCB (HOC) | 55. |
| Para Amino Acetanilide | 200. |
| 1-Phenyl 3-Methyl 5-Pyrazolone | 130. |
| Phenyl J. Acid | 355. |
| Para Amino Benzoic Acid | 135. |
| PT Base | 135. |
| Rhoduline Acid | 520. |
| Resist Salt 80% | 28. |
| Resorcinol | 230. |
| Sodium Naphthionate | 65. |
| 5-Sulpho-Anthranilic Acid | 78. |
| Sulphanilic Acid | 30. |
| Sulpho Tobias Acid | 140. |
| Trichloro Benzene (TCB) | 22. |
| Tobias Acid (Imp.) | 132. |
| Metanilic Acid | 41. |
| MTD | 125 |

**We Manufacture Chemicals For Industrial Use**

- Acetic Acid
- Acetic Anhydride
- Acetaldehide
- Industrial Alcohol
- Monochloro Acetic Acid
- Ethyl Acetate
- Butyl Acetate
- E D T A
- N T A
- Carboxy Methyl Cellulose

**ASHOK ORGANIC INDUSTRIES LTD.**

406,Sharda Chambers, 33,Sir Vithaldas Thackersey Marg (New Marine Lines),Bombay-400 20
Phone : 252236 : 252256 : 317511 Gram : 'ASHOKBROS' Telex : 11-3853 AOIL IN

**Also Please Contact:**

**Baroda :** Phones : 324519-325769
Telex : 0175-597 AOIL IN
**Ahmedabad :** Phone : 78009
**Ankleshwar :** Phone : 2461-2462
Telex : 0189-238 AOIL IN
**New Delhi :** Phones : 5710733-5711057
**Calcutta :** Phones : 282474-282475
Telex : 021-7917 SBIL IN
**Madras :** Phone : 582046
Telex : 041-7527 SBIL IN
**Bangalore :** Phones: 570746-570760
Telex : 0845-8275 SBIL
**Hyderabad :** Phones : 73737-831049
**Poona :** Phone: 50797

Plants at : Nandesari - Baroda; GIDC Ankleshwar; Boridra - Bharuch

SULPHUR

SULPHUR POWDER RUBBER GRADE
99.5 to 100% pure, free from A.S.T.
THREE WHEELS BRAND

THREE WHEELS

SULPHUR POWDER EXPLOSIVE GRADE
99.5% pure, free from A.S.T.

AGRICULTURE DUSTING POWDER
SULPHUR DUST 85% DP
KISAN BRAND

DOUBLE REFINED ROLL SULPHUR & AMLASAR (CRYSTAL SULPHUR)

Manufacturers
M/s. V.A. CHEMICAL AND SULPHUR INDUSTRIES
8, Fancy Chambers, Plot No. 94, Surat Street, Bombay 400 009.
Tel. Nos: 346989/327244/320370 Telex: 011-76463 DVS IN Gram: SULFREFINE

ETHYL CELLOSOLVE * ETHYL CARBITOL
TRICRESYL PHOSPHATE * CELLOSOLVE ACETATE
BENZYL ACETATE FFC * BENZYL ALCOHOL FFC
SODIUM BI-SULPHATE * POTASSIUM BI-SULPHATE
METHYL CELLOSOLVE ACETATE
TRI PHENYL PHOSPHATE

For Your Requirement Please Contact:

tl trade link

5/363, Mangaldas Building, Trikamji Ghia Marg, 2nd Floor, BOMBAY - 400 002.
Phone: 297718/259487; Resi: 473310 Gram: 'POLOSIGHT' Telex: 4258 PTK IN

HC

H-ACID

OF INTERNATIONAL STANDARD
FROM

SHREE HARI CHEMICALS (INDIA) PVT. LTD.

CATERING TO THE NEEDS OF DOMESTIC & EXPORT MARKETS EFFICIENTLY

**Bombay Office:** Amrit Niwas, 3rd Floor, 159/2, Cavel Cross Lane No. 6,
Kalbadevi, Bombay 400 002.
**Phones:** 292081/258697 **Telex:** 011-5394 ANUJ IN (SHC)
**Works:** A/8, M.I.D.C., Mahad, Distt. Raigad
**Phone:** 2711/2713

# Bombay Dyes Market

(Prices as on August 13, 1990)

| ACID COLOURS | Per Kg. |
|---|---|
| Acid Violet 4BS | *190.00 |
| Acid Maroon V | 110.00 |
| Acid Orange II | 112.55 |
| Acid Orange IIY | 93.85 |
| Acid Red A | 137 00 |
| Acid Scarlet 3R | 128 35 |
| Acid Red 3BN | *195.00 |
| Acid Red R2R | 132 00 |
| Acid Red RS | 88 00 |
| Acid Patent Blue AS | *280 00 |
| Acid Green V | *375.00 |
| Acid Coomasi Blue | 200 00 |
| Acid Yellow 5GN | 65 00 |
| Acid Red PG | 85.00 |
| Acid Red GRS | 78.00 |
| Acid Black 10 BX | 157 15 |
| Acid Black BX | 126 95 |
| Acid Black Wax | 135 50 |
| Crosein Scarlet MOC | 200 30 |
| Procinil Yellow GS (ICI, UK) | 265 00 |
| Procinil Red GS (ICI, UK) | 530.00 |
| Procinil Blue RS (ICI, UK) | 315 00 |
| Procinil Scarlet G (ICI, UK) | 600 00 |
| Procinil Orange G (ICI, UK) | 250.00 |
| Procinil Rubine (ICI, UK) | 550.00 |

* To get resale price add 6% tax.

| DIRECT COLOURS | Per Kg. |
|---|---|
| Yellow 3GX | 114.00 |
| Gun Yellow RCH | 175 85 |
| Fast Yellow GCH | 171.50 |
| Yellow CFG Hly. Conc. | 721.00 |
| Fast Yellow GS | 126 96 |
| Fast Yellow CHRS | 116.85 |
| Viscose Orange A | 210 35 |
| Fast Orange GR | 171.50 |
| Red | 122.65 |
| Dark Tan | 98.15 |
| Red IIR | 98.15 |
| Red 4B | 217.55 |
| Bordeaux BW | 170.10 |
| Fast Scarlet 4BS | 223.50 |
| Red 12B | 220.45 |
| Bordeaux Hly. Conc. | 249.20 |
| Cotton Red N | 117.05 |
| Brill. Fast Helio B | 362.85 |
| Brill. Fast Helio 2R | 385.85 |
| Brill. Fast Helio 2RS | 177.30 |
| Brill. Fast Helio BS | 116.10 |
| Brill. Violet Extra | 181.45 |
| Blue 2B | 102.50 |
| Blue G | 220.45 |
| Sky Blue FB | 242.00 |
| Copper Blue GR | 190.25 |
| Fast Greenish Blue GI | 114.60 |
| Developed Black BT | 149.95 |
| Blue NB-2B | 348.45 |
| Blue NB-2BG | 214.70 |
| Developed Black NB-GHB | 214.70 |
| Green B | 142.75 |
| Green NB-B | 218.90 |
| Green 2B-N | 218.90 |
| Brown MR | 197.40 |
| Brown CN | 137.00 |
| Golden Brown G | 175.85 |
| Catechin G | 155.70 |
| Omega Tan | 161.45 |
| Catechin GS | 102.80 |
| Black E Hly. Conc. | 180.15 |
| Black E Extra Hly. Conc. | 180.15 |
| Black NB-ER Hly. Conc. | 290.50 |

| DISPERSOL COLOURS | Per Kg. |
|---|---|
| Red B 3B Conc | 611.50 |
| Red B 2B Conc | 797.90 |
| Red CB Powder | 1048.25 |
| Red D2B Powder | 599.85 |
| Violet C 4R Conc. | 1202.70 |
| Blue BG Conc | 580.65 |
| Blue BN Powder | 1[illegible] |
| Blue D 2R Powder | 588 [illegible] |
| Navy BT Conc | 531 [illegible] |
| Blue B 2G Conc | 577.95 |
| Black BT Conc | 319.50 |
| Blue RR | 482.40 |
| Yellow 7GL | 813 20 |
| Yellow 5RX | 269 90 |
| Yellow 3G | 473.20 |
| Yellow | 140.00 |
| Yellow AL | 167.20 |
| Yellow Brown REL | 311.70 |
| Yellow FFL | 571 40 |
| Gold Yellow GG | 320.80 |
| Pink REL | 593 00 |
| Red BEL | 615 60 |
| Red 2B | 422.40 |
| Red FB | 425.80 |
| Red Violet FBL | 622.00 |
| Orange 3R | 254.20 |
| Violet 3R | 370.50 |
| Violet RL | 355.70 |
| Violet 6R | 638.20 |
| Scarlet RR | 283.50 |
| Rubine 3B | 289.10 |
| Rubine CB | 449.50 |
| Blue GL | 419.00 |
| Blue BGF | 805.80 |
| Navy Blue RE | 359.90 |
| Brown 3REL | 272.80 |
| Black GEL | 420.10 |
| Dark Brown 3B | 411.10 |

| BASE COLOURS | Per Kg. |
|---|---|
| Fast Yellow GC | 77.75 |
| Fast Orange GC | 128.40 |
| Fast Scarlet R | 198 05 |
| Fast Scarlet RC | 128 40 |
| Fast Scarlet RCR | 105.60 |
| Fast Scarlet G | 115.75 |
| Fast Scarlet GN | 92 95 |
| Fast Scarlet GG | 77 75 |
| Fast Scarlet GGS | 73 95 |
| Fast Red B | 233 50 |
| Fast Red RC | 115.75 |
| Fast Red R Flakes | 158 80 |
| Fast Red TR | 181 60 |
| Fast Red TR Oil | 223 35 |
| Fast Red RL | 251.20 |
| Fast Red KB Oil | 251.20 |
| Fast Bordeaux GP | 236.00 |
| Garnet GBC | 103 05 |
| Fast Violet B | 548 80 |
| Fast Blue BB | 566.50 |

| NAPHTHOL COLOURS | Per Kg. |
|---|---|
| ASG | 301.85 |
| AS | 205.65 |
| ASSW | 379.10 |
| ASBS | 253.75 |
| ASBO | 266.40 |
| ASD | 209.45 |
| ASOL | 243.60 |

| | |
|---|---|
| ASTR | 369.00 |
| ASPH | 336.05 |
| ASE | 236 00 |
| ASEL | ,249.95 |
| ASLB | 2002.35 |
| ASBT | 2459.45 |
| ASWG | 143.00 |
| ASSG | 538.65 |
| ASSR | 652.60 |

| PROCION COLOURS | Per Kg. |
|---|---|
| Golden Yellow HR | 207.95 |
| Brill. Yellow H4G | 145.65 |
| Supra Yellow H-8GP | 168.55 |
| Brill. Yellow HE6G | 214.75 |
| Yellow G-E4R | 276.05 |
| Brill. Yellow H7G | 332.30 |
| Yellow M4R | 275.45 |
| Yellow MGR | 387.65 |
| Brill. Yellow M4G | 201.15 |
| Brill. Yellow M8G | 366.10 |
| Yellow M3R | 244.70 |
| Brill. Orange H2R | 303.80 |
| Brill. Red H7B | 157 95 |
| Brill. Orange M2R | 313 15 |
| Brill. Red H8B | 213 55 |
| Brill. Scarlet H RN | 245.05 |
| Supra Red H-3BP | 179.80 |
| Brill. Red H-F3B | 243.45 |
| Brill. Magenta HB | 182 00 |
| Brill Red M 5B | 160 05 |
| Brill Red M 8B | 218 35 |
| Brill. Pink MB | 137 10 |
| Brill. Magenta MB | 163.65 |
| Brill. Purple H-3R | 219.55 |
| Brill. Purple H-7R | 175.40 |
| Navy Blue H 3R | 333.75 |
| Brill Blue H-GR | 406.40 |
| Brill. Blue H5G | 207 95 |
| Blue H 5RX | 286.20 |
| Brill. Blue H 7G | 213.95 |
| Brill. Blue H 7RX | 358.15 |
| Turquoise HA | 265.05 |
| Supra Blue H-3RP | 595.30 |
| Supra Turquoise H 2G P | 181.50 |
| Blue H-FRD | 305.80 |
| Navy Blue H3R | 333.75 |
| Blue H 5RX | 286.20 |
| Navy Blue M3R | 355.70 |
| Brill. Blue MR | 405.60 |
| Brill. Blue M RX | 214.20 |
| Brill. Blue M-G | 226.45 |
| Blue M 4GD | 369.40 |
| Navy Blue M RB | 341.85 |
| Turquoise M-G | 240.30 |
| Brill. Blue M GX | 516.25 |
| Blue 3R Acra Powder | 718.20 |
| Dark Brown H 6R | 248.45 |
| Cobalt Oxide | 285.00 |
| Green H4BD | 287.00 |
| Green H-E4BI | 169.80 |
| Red Brown H IF | 143.25 |
| Orange Brown H 28 | 209.05 |
| Brown M GRN | 188.80 |
| Black H-N | 314.20 |

| SULPHUR COLOURS | Per Kg. |
|---|---|
| Navy Blue | 210.35 |
| Green G | 194.55 |
| Black Grains Extra | 72.25 |
| Black Grains OG | 73.70 |
| Black GXE Conc. | 70.85 |
| Black GXE | 57 90 |
| Black GXR | 69.40 |
| Black Grains 800 | 62 80 |
| Black EXR Greins | 73.70 |
| Black EXR Grains 800 | 59 35 |

| VAT COLOURS (ICI) | Per Kg. |
|---|---|
| Yellow 5G Supra Disperse | 561.85 |
| Yellow 5G Acra Conc | 818 60 |
| Gold Orange 3G Pdr. Fine | 1158 45 |
| Brill. Orange 6R Pdr. Fine | 624 35 |
| Gold Orange 3G Supra Disp | 693 85 |
| Brill. Orange 6RX Powder | 394.30 |
| Brill. Red 3B Pdr. Fine | 1214.15 |
| Brill. Red 3B Supra Disp | 867.45 |
| Brill. Purple 3R Acra Powder | 827 05 |
| Brill. Purple 2R Hly Conc. | 744.25 |
| Brill. Purple 4R Supra Disp. | 604.25 |
| Brill. Purple 2R Acra Conc. | 779.65 |
| Blue 2R Powder Fine | 675,30 |
| Blue BC Acra Con Pdr. Fine | 1013.15 |
| Blue BC Conc. Pdr. Fine | 713.65 |
| Blue R Conc. Pdr. Fine | 719.70 |
| Blue Conc. Powder | 645.80 |
| Brill. Blue 2R Hly. Conc. | 378.55 |
| Blue RR Supra Powder | 629.25 |
| Brill. Blue 2R Supra Disp. | 115.65 |
| Dark Blue 2R Powder Fine | 512.65 |
| Blue BC Supra Disp. | 419.65 |
| Jade Green XBN Powder Fine | 555.80 |
| Jade Green XBN Acra Conc. Pdr | 1026.05 |
| Jade Green 2G Pdr. Fine | 533.25 |
| Jade Green 2G Ptg. Paste | 125.40 |
| Jade Green XBN Ptg. Paste | 126.00 |
| Jade Green 2G Supra Disp. | 618.00 |
| Olive D Pdr. Fine | 563.90 |
| Olive Green B Supra Disp. | 421.70 |
| Jade Green XBN Supra Disp. (N) | 327.30 |
| Olive OMW Powder Fine | 698 55 |
| Olive OMW Supra Disp. | 538.05 |
| Olive D Supra Disp. | 361.70 |
| Olive R Supra Disp. | 470.25 |
| Olive D. Ptg. Paste | 193.00 |
| Olive Green B Ptg. Paste | 199.10 |
| Olive Green B Acra Conc. | 741 10 |
| Olive R Acra Conc.. | 779.85 |
| Brown R Pdr. Fine | 869.45 |
| Dark Brown 3R Fine | 826.25 |
| Brown G Supra Disp | 582 05 |
| Brown 2G Supra Disp | 716 10 |
| Brown R Supra Disp. | 547 35 |
| Brown BR Powder | 867.75 |
| Dark Brown 3R Ptg. Paste | 217 15 |
| Dark Brown 3R Supra Disp | 529 60 |
| Brown G Acra Conc. | 967.95 |
| Brown M. Powder Fine | 768.80 |
| Grey M. Supra Disp. | 585.45 |
| Blue BC Acra Conc. Pdr. Fine | 762.70 |
| Direct Black AC Supra Disp. | 415.75 |
| Direct Black AC Pdr. Fine | 574.70 |
| Direct Black CH Supra Disp | 190 45 |
| Direct ACD Ptg. Paste | 217 15 |

# Delhi Market

**DELHI: AUGUST 10 NNS** Slack and match wax spurted sharply by Rs. 300/750 at Rs. 10,500 and Rs. 16,500 per tonne respectively in the Delhi chemicals market during the last week, in view of negligible supply combined with spurt in demand for coming festival. Similarly paraffin wax registered a gain of Rs. 25 at Rs. 1000 per 50 kg on account of good demand from candle manufacturers as well as restricted supply, whereas residue wax ruled quiet at its previouslevel of Rs. 3,800 per tonne.

As a result of huge stock under the control of stockists and distributors, combined with fall in demand from plastic and paint units, titanium dioxide K brand and TTP slipped by Rs. 2 at Rs. 59 and Rs. 62/kg respectively. Titanium dioxide RC-822 slipped by Rs. 3 at Rs. 84, owing to nervous offerings.

Arrival of imported goods was reported around 35 tonnes of hydrogen peroxide and its prices went down by Rs. 3 at Rs. 34. Caustic soda flakes and citric acid drifted lower by Rs. 10/25 at Rs. 520 and Rs. 1,900/2,350/50 kg on withdrawal of demand by local and outside consumers. Sodium nitrite slipped again by Rs. 50 at Rs. 1,050/1,250 thanks to pressure of offerings by stockists. Arrivals of menthol were reported about 80 tonnes from Sambhal, Rampur, Moradabad, Amroha and Chandausi areas of U.P., consequently menthol medium and bold suffered a fall of Rs. 10 at Rs. 300 and Rs. 340. Menthol flake ruled quiet at Rs. 285. Mentha oil receded by Rs. 2 at Rs. 198, whereas DMO rose by Rs. 5 at Rs. 90 owing to reduced supply.

On account of dwindling stock, combined with good demand from bakeries and halwaies, ammonia bicarb flared up by Rs. 10 at Rs. 190/25 kg. Mercury recorded a rise of Rs. 100 at Rs. 11,100 per flask due to poor supply. In the wake of increased demand from gur and khandsari manufacturers, sodium hydrosulphite Gulshan and Kalali moved up further by 25 paise at Rs. 38 and Rs. 41.

Chatkolite and rangolite Germany quoted higher by Re. 1 each at Rs. 55 and Rs. 84/kg following good demand from textile units. Camphor thal jumped up by Rs. 2 at Rs. 110 in view of increased demand for coming festivals. No noticeable variation prevailed in the prices of dyes and colours in thin trading.

## (DELHI MARKET RATES AS ON AUGUST 10, 1990)

| | |
|---|---|
| Ammonia Bicarb (Per 25 Kg.) | 190 00 |
| Mercury (Per flask) | 11,100.00 |
| Soda ash (Per bag) | 360/380 00 |
| Ammonium Chlonde (50 Kg.) | 120/180 00 |
| Caustic soda flakes (50 Kg.) | 520 00 |
| Citric acid (Per 50 Kg.) | 1,900/2,350.00 |
| Stable Bleaching Powder Shriram (Per 25 Kg.) | 101.00 |
| Stable Bleaching Powder KCI (Per 25 Kg.) | 90 00 |
| Stable Bleaching Powder Maruti (Per 25 Kg.) | 91 00 |
| Stable Bleaching Powder Modi (Per 25 Kg.) | 92 00 |
| Sodium Bicarbonate (50 Kg ) | 315/325 00 |
| Sodium Hydrosulpnite (Per Kg ) | 38 00/41 00 |
| Rangolite (Per Kg.) | 84.00 |
| Tartaric acid France (Per Kg.) | 290.00 |
| Sufolite (Per Kg.) | 56.00 |
| Chatkolite (Per Kg.) | 55.00 |
| DMO (per Kg.) | 90.00 |
| Boric acid Technical (Per 50 Kg.) | 1,525.00 |
| Paraffin Wax (Per 50 Kg ) | 1,000.00 |
| Slack wax (Per metric tonne) | 10,500.00 |
| Tartaric Acid (Swastik Per Kg.) | 225.00 |
| Borax Granular (Per 50 Kg.) | 800.00 |
| Borax Crystal (Per 50 Kg.) | 825.00 |
| Sodium Nitrite (Per 50 Kg.) | 1,050/1,250.00 |
| Sodium Nitrate (Per 50 Kg ) | 500.00 |
| Camphor Thal (Per Kg ) | 110.00 |
| Camphor Powder (Per Kg ) | 96.00 |
| Menthol Bold (Per Kg ) | 340.00 |
| Menthol Medium (Per Kg ) | 300 |
| Menthol Flake (Per Kg.) | 285 |
| Mentha Oil (Per Kg.) | 198 |
| Glycenne (Per Kg.) | 55/58 |
| Sodium Silicate (Per quintal) | 300/400 |
| Hexamine (Per Kg.) | 34 |
| Acetic Acid Glacial (Per Kg ) | 13 7 |
| Copper Sulphate (Per quintal) | 2,300/2,60 |
| Formic Acid (Per Kg ) | 24 |
| Formaldehyde (Per Kg ) | 8 5 |
| Hydrogen Peroxide (Per Kg.) | 34 0 |
| Calcium Carbonate (Per Tonne) | 2,800/5,80 |
| Acid Slurry Soft (Per Kg.) | 27.0 |
| Acid Slurry Hard (Per Kg.) | 32.0 |
| Phosphoric Acid (Per 50 Kg.) | 1,235.0 |
| Potassium Nitrate (Per quintal) | 1,000/1,250.0 |
| Potassium Permanganate (Per 50 Kg.) | 2,600/3,000.0 |
| Sodium Bichromate (Per 50 Kg.) | 1,575/1,600.0 |
| Trisodium Phosphate (50 Kg.) | 570.0 |
| Titanium Dioxide Anatase T.T.P (Per Kg.) | 62.0 |
| Titanium Dioxide RC-822 (Per Kg.) | 84.0 |
| Titanium Dioxide Anatase K Brand (Per Kg.) | 59.0 |
| Titanium Dioxide RCR-2 (Per Kg.) | N.A |
| Zinc Oxide (Per Kg.) | 46.00/50 0 |
| Phenol Carbolic Acid (Per Kg.) | 39.0 |
| Carbon Tetrachloride (Per Kg.) | 24 75 |
| Chloroform (Per Kg.) | 28.0 |
| Sodium Sulphate (Per metric tonne) | 3,600/3,900 0 |
| Naphthalene Balls (Per 50 Kg.) | 1,375.0 |
| **DYES & COLOURS** | **(Per Kg.** |
| Naphthol AS | 175/211.50 |
| Naphthol ASG | 180/249 70 |
| Naphthol ASBS | 210/260 75 |
| Naphthol ASTR | 300/378.92 |
| Naphthol ASOL | 210/250 90 |
| Naphthol ASBO | 195/274.30 |
| **DIRECT DYES** | **(Per Kg.)** |
| Black E. Conc. | 120/185.30 |
| Diazo Black B.T | 105/154.50 |
| Green B | 90/147.55 |
| Blue 2-B | 60/107.00 |
| Blue 2-B 225% (JNR) | 125.00 |
| Sky Blue FB | 160/248.20 |
| Basic Auramine | 55/110.00 |
| Basic Rhodamine | 300/425.00 |
| Basic Methylene Blue | 100/180.00 |
| Basic Violet | 165/210.00 |
| Basic Malachite Green | 175.00 |
| Acid Orange | 75/111.20 |
| Congo Red H/C | 75/120.95 |

# Madras Market

Quiet condition prevailed except r a spurt in prices of hydrogen perxide due to closure of National Perxide plant at Bombay.

There was also a shortage of phthalic anhydride due to raw material shortage pushing up the prices marginally.

## (MADRAS MARKET RATES AS ON AUGUST 11, 1990)

| | |
|---|---|
| Acetic Acid Glacial (per kg) | 14 50 |
| Aluminium Sulphate Iron free (per MT) | 3,800.00 |
| Ammonium Bicarbonate (per 25 kgs) | 150.00 |
| Ammonium Chloride (per MT) | 2,110 00 |
| Acid Slurry (per kg) | 31 00 |
| Barium Carbonate (per kg) | 11.00 |
| Barium Chloride (per kg) | 10.00 |
| Boric Acid Technical (per kg) | 26 00 |
| Bleaching Powder (per 50 kgs) | 220 00 |
| Borax (per 50 kgs) | 785.00 |
| Caustic Soda Flakes -- Mettur Chemicals (per MT) | 11,500 00 |
| Caustic Soda Flakes -- Aruna Sugars (per MT) | 11,500.00 |
| Calcium Chloride 70% Solid (per MT) | 3,500.00 |
| Calcium Chloride Anhydrous (per MT) | 6,000 00 |
| Calcium Carbonate (Activated) (per MT) | 6,500.00 |
| Calcium Carbonate (Precipitated) (per MT) | 5,500.00 |
| Citric Acid (per kg) | 48.00 |
| Copper Sulphate (per kg) | 22.00 |
| Cresylic Acid 98-99% (per kg) | 130.00 |
| Pure Para Cresol 96% (per kg) | 85 00 |
| Meta Para Cresol 42% (per kg) | 52 00 |
| Formic Acid (per kg) | 27.00 |
| Formaldehyde (per kg) | 8.00 |
| Glue Flakes (per kg) | 15 00 |
| Glycerine I.W. (per kg) | 48 00 |
| Hydrosulphite of Soda (TCPL) (per kg) | 38 00 |
| Hydrosulphite of Soda (IDL) (per kg) | 42 00 |
| Hydrosulphite of Soda (BASF) (per kg) | 48.00 |
| Hexamine (per kg) | 31 50 |
| Hyflosupercell (per kg) | 20 50 |
| Hydrogen Peroxide (per kg) | 40 00 |
| Litharge (per kg) | 38 00 |
| Lead Acetate (per kg) | 38 00 |
| Magnesium Carbonate (per kg) | 16 00 |
| Magnesium Chloride (per kg) | 3.50 |
| Maleic Anhydride (per kg) | 40 00 |
| Menthol Crystals (per kg) | 345 00 |
| Oxalic Acid (per kg) | 17 00 |
| Paraffin Wax (per kg) | 18 00 |
| Potassium Bichromate (per kg) | 36 00 |
| Phosphoric Acid (per kg) | 29 00 |
| Polyvinyl Alcohol Powder (per kg) | 150 00 |
| Pentaerythritol (per kg) | 52 00 |
| Phthalic Anhydride (per kg) | 35 00 |
| Soda Ash (TAC) (per 75 kgs) | 410 00 |
| Soda Ash (TATA) (per 75 kgs) | 410 00 |
| Sodium Bicarbonate (TATA) (per 50 kgs) | 385 00 |
| Sodium Silicate (per MT) | 3,750 00 |
| Sodium Bichromate (per kg) | 28 00 |
| Sodium Nitrate (per kg) | 8 00 |
| Sodium Nitrite (per kg) | 22 00 |
| Sodium Sulphide Flakes (per kg) | 20 00 |
| Sodium Bisulphite (per kg) | 8 00 |
| Sodium Alginate (per kg) | 290 00 |
| Sodium Acetate (per kg) | 7.50 |
| Sodium Sulphate (Anhydrous) (per kg) | 3.75 |
| Titanium Dioxide (Anatase) (per kg) | 62.00 |
| Titanium Dioxide (Rutile) (per kg) | 80 00 |
| Trisodium Phosphate (per kg) | 10 00 |
| Urea (Technical) (per kg) | 3 00 |
| Zinc Oxide (per kg) | 52 00 |
| Zinc Chloride Powder (per kg) | 13 50 |
| Zinc Sulphate (per kg) | 8 00 |

### SOLVENTS

| | |
|---|---|
| Acetone -- HOCL (per kg) | 18 50 |
| Butanol (per kg) | 36 00 |
| Butyl Acetate (per kg) | 42 00 |
| Benzene (per lit) | 14 00 |
| Cellosolve (per kg) | 65 00 |
| Carbon Tetra Chloride (per kg) | 21 00 |
| Chloroform (per kg) | 28 00 |
| Diacetone Alcohol (per kg) | 30 00 |
| Diethylene Glycol (per kg) | 30 00 |
| Dichloroethane (per kg) | 18 00 |
| Di-octyl Phthalate (per kg) | 46 00 |
| Di-N-butyl Phthalate (per kg) | 46 00 |
| Ethyl Acetate (per kg) | 17 00 |
| Isopropyl Alcohol (per kg) | 28 50 |
| Methanol (per kg) | 10 00 |
| Methylene Chloride (per kg) | 22 00 |
| Methyl Ethyl Ketone (per kg) | 32 00 |
| Methyl Isobutyl Ketone (per kg) | 42 00 |
| Phenol (per kg) | 38 00 |
| Sorbitol (per kg) | 15 00 |
| Triethanolamine (per kg) | 90 00 |
| Trichloroethylene (per kg) | 26 00 |
| 1-1-1 Trichloroethane (per kg) | 29 00 |
| Turpentine (per lit) | 16 00 |
| Toluene (per lit) | 14 00 |
| Xylene (per lit) | 20 00 |

# Shipping News

## VESSELS DUE IN BOMBAY FOR EXPORT LOADING

| Due Date (1) | Steamer's Name & Flag (2) | Agents (3) | Will load for (4) | Approx. sailing dt. (5) |
|---|---|---|---|---|
| Stream | Berezovka (Rus) | Transocean | Aden; Jeddah; Odessa. (Carting at B-PD) | 22/8 |
| 20/8 | Ever Bridge (V-036) (Pan) | Greenways | Hamburg; Felixstowe; Rotterdam; Antwerp; Le Havre; London; Liverpool; Leixoes; Lisbon; Manchester; Avonmouth; Wembly; Birmingham; Leeds; Leicester; Amsterdam; Bremen; Copenhagen; Aarhus; Gothenburg; Olso; Stockholm; Helsinki; Belfast and all destinations in U.K., Germany; Switzerland and Austria. (Carting at G/H Cotton Depot). | 26/8 |
| 20/8 | CMB Merzario (Nhava Sheva) | C.M.B./ Merzario | Port Sudan; Jeddah; La Spezia; Valencia; Genoa; Barcelona; Marseilles; Tunis; Casablanca; Tangier; Alexandria; Piraeus; Mersin; Limassol; Felixstowe; London; Liverpool; Manchester; Birmingham; Avonmouth; Dublin and all inland destinations in U.K.; Antwerp; Rotterdam; Hamburg; Bremen; Leixoes; Lisbon; Copenhagen; Oslo; Gothenburg; Stockholm; Malmao; Aarhus; Helsinki. (Crtng. at Kalamboli for both). | 22/8 |
| 22/8 | Medipas Wave (Cyp) | L. Triest/ | Jeddah; Barcelona; Marseilles; Genoa; Leghorn; La Spezia; Naples with TP. Trieste; Venice; Ravenna; Bari; Koper; Rijeka; Las Palmas; Santacruz; De Teneriffe; Malta; Limmassol; Alexandria; Casablanca; Tunis; Algiers; Lattakia; Tripoli; Benghazi; Oran; Point E Pitre; Port De France. (Carting at M-171/178 Cotton Depot). | 27/8 |
| | | Samrat/ Hindustan | Jeddah; Barcelona; Marseilles; La Spezia; Livorno; (Leghorn); Genoa; Naples and other Italian ports and FCL only Beirut; Alexandria; Valletta; Lattakia; Mersin. (Carting at Mallett Bunder for both). | |
| 20/8 | Kota Ratna (Sing) | Mackintosh | Jeddah; Aden; Aqaba. | 26/8 |
| 29/8 | Robert E Lee | M.S.P.L. | Assab; P.Suez; (Alexandria). (Carting at P/Q-PD). | 29/8 |
| 20/8 | Kota Ratna | Mackintosh | Karachi (Afghanistan). | 26/8 |
| 20/8 | Ever Bridge (V-036) (Pan) | Greenways | Singapore; Penang; Port Kelang; Bangkok; Djakarta; Surabaya; Manila; Cebu; Kaohsiung; Keelung; Osaka; Yokohama; Kobe; Shimizu; Moji; Nagoya; Busan; Hongkong. (Carting at G/H Cotton Depot). | 26/8 |
| 18/8 | Ocean Strength (Mon) (V-25A/B) | O.S.A./ | P. Kelang; Singapore; Kaohsiung; Hongkong; Bangkok; Kobe; Yokohama; Nagoya; Moji; Osaka; Busan; Tokyo; Shimizu; Keelung; Tsingtao; Quindao; Xiangang; Shanghai. (Carting at M-178/180 C.D.) | 23/8 |
| | | M.S.P.L. | Singapore; Bangkok; P. Kelang; Penang; Jakarta; Ho-Chi-Min. (Carting at E.G.D.). | |
| 15/8 | Putvil (Rus) | Transocean | Singapore; Main Japan Ports. | 29/8 |
| 29/8 | Robert E Lee | M.S.P.L. | Singapore; P. Kelang. (Carting at P/Q-PD). | 29/8 |
| 18/8 | Ocean Strength | O.S.A. | Sydney; Melbourne; Adelaide; Brisbane; Fremantle; Auckland; Wellington; Lyttelton; P. Chalmers. (Carting at M-178/180 Cotton Depot). | 23/8 |
| Stream | Al Zawraa (Iraqi) | Al Rafidam | Umm Qaser (Iraq) | 22/8 |
| 15/8 | E. Kwiatkowski (Pol). | Khemka | Dammam. | 22/8 |
| 18/8 | Rossana (Voy-46) | Mackintosh | Muscat; Dubai. | 26/8 |
| 22/8 | Banglar Robi | Sai Ship | Mogadiscia; Mombasa; Dar Es Salaam; Beira; Maputo. (Carting at E-Grain Depot). | 26/8 |
| 26/8 | Vishva Kaumudi | S.C.I. | P. Louis; Mombasa; Dar Es Salaam; Beira. | 6/9 |
| 18/8 | Ocean Strength (V-25A/B) | O.S.A. | New York; Baltimore; Philadelphia; Houston; Boston; Chicago; Dallas; Atlanta; Savannah; Norfolk; Charleston; Los Angeles; San Francisco; Oakland; Seattle; Vancouver; Toronto; Montreal; Portland; Tacoma & S. American & W. Indies Ports. (Carting at M-178/180 Cotton Depot). | 23/8 |
| 20/8 | Ever Bridge (Voy-036) | Greenways | New York; Newark; Baltimore; Charleston; New Orleans; Houston; Boston; Providence (RI); Philadelphia; Norfolk; Savannah; Jacksonville; Wilmington; Miami; Montreal; Toronto; Bermuda; Los Angeles; Longbeach; San Fracisco; Oakland; San Diego; Stockton; Richmond; Almeida; Redwood City; Sacramento; Seattle; Portland; Vancouver (B.C.); Tacoma; Longview; Chicago; Dallas; Various inland destinations & Caribbean Ports. (Carting at G/H Cotton Depot). | 26/8 |
| 29/8 | Robert E Lee (Arne) | M.S.P.L. | Philadelphia; Baltimore; Norfolk; New Orleans; Houston; Savannah; New York. (Carting at P/Q-PD). | 29/8 |

| (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|
| 20/8 | CMB Merzario/ (Nhava Sheva) | C.M.B. | Norfolk; New York; Baltimore; Philadelphia; Charleston; Savannah; Houston; Miami; New Orleans via Antwerp; Montreal; Toronto; Halifax. (Carting at Kalamboli). | 22/8 |
| 24/8 | Hoegh Drake | Patvolk | Montreal & Toronto via Halifax; New York; Boston; Norfolk; Charleston; Houston; Savannah; Wilmington; Philadelphia; Baltimore; New Orleans; & FCL Chicago; Milwaukee; Atlanta; Dallas. (Carting at H.B. No. 5). | 31/8 |
| 22/8 | Medipas Wave | Samrat/ Hindustan/ L. Triest | Boston; New York; Baltimore; Norfolk; Charleston; P. Mouth; P. Lauderdale; Miami; New Orleans; Savannah; Jacksonville; P. Everglades; Philadelphia; Halifax; Montreal; Toronto; & S. American Ports. (Carting at Mallet Bunder for Samrat & Hindustan) (Carting at M-171/173 Cotton Depot for L. Triest) | 27/8 |
| 20/8 | CMB Merzario (Nhava Sheva) | C.M.B. | Lagos; Abidjan: Lome; Douala; Matadi; Port Gentil; Pointe Noire; Nouakchott; Cotonou; Dakar; Luanda; Monrovia; Tema via Antwerp; (Carting at Kalamboli). | 22/8 |
| 22/8 | Medipas Wave | L. Triest | With T.P. Lagos/Apapa; Abidjan; Dakar; Douala; Cotonou; Nouakchott; Libreville; Tema; Matadi; Conakry; Freetown. | 27/8 |

## VESSELS DUE FOR IMPORT DISCHARGE

| Due Date | Steamer's Name | Agents | From |
|---|---|---|---|
| 27/8 | Amer Prabha | Prudential | Cont. |
| 24/8 | Hoegh Drake | Patvolk | U.S.A. |
| 31/8 | Ind. Renown | I.S.S. Co. | U.K. Cont. |
| 22/8 | Medipas Wave | L. Triest/Hindustan | U.K. Cont. & Med. Ports. |
| 29/8 | Robert E Lee | M.S.P.L. | U.S.A. |
| 30/8 | S/o. Andhra Pradesh | S.C.I. | U.S./Canada |
| 25/8 | Vishva Shakti | S.C.I. | Med. Ports. |
| 22/8 | Vishva Parag | S.C.I. | U.K. Cont. |

**FOR DAZZLING WHITENESS ON POLYESTER AND POLYESTER BLENDS FABRICS USE**

**THE BEST POSSIBLE**

**"WHITENING AGENT-R"**

**AT LOWEST POSSIBLE RATE**

For your regular requirement of

**WHITENING AGENT-R**

CONTACT

**BOX NO. 1263**

**CHEMICAL WEEKLY**
306, Shri Hanuman Industrial Estate,
G.D. Ambekar Road, Wadala,
Bombay 400 031.

For Your Requirements Of:

**ZINC ASH, ZINC DUST, ZINC OXIDE** (OFF COLOUR)
**BRASS ASH & COPPER ASH**

Very Suitable for

**Zinc Sulphate & Copper Sulphate**

WE PURCHASE

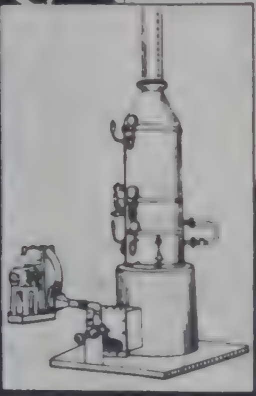
Scrap -- Waste -- Ash -- Residues of

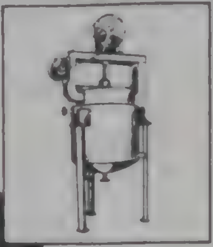
NICKEL -- TIN -- COBALT AND OTHER NON-FERROUS METALS

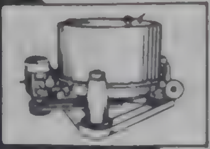
Please Contact: **HINDUSTAN METALS**
13, Broadway Shopping Centre, 1st Floor, Dadar T.T., Bombay-400 014
Gram: 'RESIDUE' Bombay-400 014
Phones: 4121356/4127014

Are you in the look-out for Reliable fabricators?

Then your search ends here.







We design & fabricate industrial equipments for chemical, pharmaceutical & allied industries such as:

• Centrifuge / Hydro extractors • Pressure reaction vessels • Non IBR oil / coal fired vertical boilers • Electric / Steam heated tray dryers • Thermic fluid heaters • Laboratory ovens • Ball mills

Over & above we undertake specially designed projects in chemical or engineering field on turn key basis.

WRITE TO

**K.V. Dalal & Co.** DESIGNERS & FABRICATORS

ADMN OFF B/24 VRAJ VILLA AMRUT NAGAR,
GHATKOPAR (W), BOMBAY-400 086 TELEX NO 011-72106 APPU IN
GRAMS SAMRUDHI BOMBAY 86 • PHONE 586690
WORKS 886/C GIDC MAKARPURA, BARODA 390 010 • PHONE 42743

- **Spindle Oils, Metal Working Oils, drawing compounds and speciality mineral White Oils.**
- **Naphthenate & Octate Driers, Offset Ink Media, Letter Press Varnishes, Synthetic Drying Oils for Paint and Printing Ink Industries.**
- **Copper and Zinc Naphthenates as Fungicides and Wood Preservatives.**
- **Synthetic Pine Tar and Process Oils, Mould release & Separating Agents and Micraffins for Rubber Industries.**
- **Petroleum Jellies: White, Pale Yellow and Amber and Speciality Waxes.**
- **Wax Emulsions and auxiliaries for Leather, Paper, Textiles and Wood Industries.**
- **Hard and Synthetic waxes for use in Polishes, Castings, Carbon Paper, Adhesives, Coatings etc.**
- **Petrochemical Specialities: Mahathol Calibration Oil for Diesel Injection Test Benches; Additives for fuels and lubricants.**

Manufacturers:

MAHATHA

**MAHATHA PETROCHEMICALS** (Estd. 1969)
*(Manufacturers of Speciality Oils, Waxes, Additives etc.)*
Sree Meenakshi Gardens, Kizhakattalai, Old Pallavaram P.O. Madras 400 043.
Grams: PETROCHEM Phone: 431542

# Materials Imported/Exported

## MATERIALS IMPORTED
## MADRAS
(From 17.4.90 to 30.4.90)
(Continued from previous issue)

SODIUM BORATE CRUDE: From Turkey: Bansali Chemicals, 50 Mts., Rs. 2,99,057; STC of India, 50 Mts., Rs. 2,96,269.

SILICON COPOLYMER: From Japan: Ceat Tyres of India Ltd., 36 Kgs., Rs. 36,516.

SILICON RUBBER: From USA: Sundaram Inds. Ltd., 113.5 Kgs., Rs. 42,645.

SULPHUR INSOLUBLE: From FRG: MRF Ltd., 27,000 Kgs., Rs. 8,74,419.

STYRENE OXIDE: From Japan: ICI India Ltd., 10 Mts., Rs. 4,98,848.

TARTARIC ACID: From Spain: Dr. Reddy's Labs., 20 Mts., Rs. 15,23,857.

TETRAKIS (METHYLENE 3,5, DI. TERT.): From Belgium: Urethanes India Ltd., 50 Kgs., Rs. 14,313.

THIOACETIC ACID: From Japan: Wockhardt Ltd., 2,000 Kgs., Rs. 3,95,947.

TIN OXIDE (SUPERLITE): From UK: EID Parry India Ltd., 100 Kgs., Rs. 26,491.

TITANIUM DIOXIDE RUTILE: From Japan: Addison Paints & Chemicals, 35 Mts., Rs. 16,38,461.

TOLUENE DI ISOCYANTE: From FRG: HPF Mfg. Co. Ltd., 910 Kgs., Rs. 1,48,679.

TONSIL OPTIMUM: From Indonesia: Foods Fats & Fertilisers, 17,000 Kgs., Rs. 1,09,769.

TRIFLUOROPIPERAZINE BASE: From Hungary: Eskaylef Ltd., 220 Kgs., Rs. 5,01,827.

3 TRIMETHYL CYCLOHEXANOL: From Denmark: Bush Boake Allen (I) Ltd., 5.3 Kgs., Rs. 427.

2,3,5 TRIMETHYL PYRAZINE: From Netherlands: Bush Boake Allen (I) Ltd., 25 Kgs., Rs. 63,055.

3,4,5 TRIMETHOXY BENZALDEHYDE: From Hong Kong: Savera Labs Ltd., 5 Mts., Rs. 19,89,460; From Netherlands: Inventaa Chemicals, 9,450 Kgs., Rs. 38,44,187.

VANILLIN TECH: From Norway: Dr. Reddy's Labs., 20 Mts., Rs. 42,02,,852.

VINYL CHLORIDE VINYL ACETATE: From Japan: Murugappa Electronics Ltd., 6,000 Kgs., Rs. 3,54,734.

VITAMIN A. ACETATE: From FRG: Medopharm, 600 Kgs., Rs. 2,67,000.

WHITE OIL: From USA: Tamil Nadu Petroproducts Ltd., 1 No. Rs. 4,185.

ZINC BACITRACIN: From Yugoslavia: Sunmex Comml. Pvt. Ltd., 2,000 Kgs., Rs. 62,826.

## DRUGS MATRIALS IMPORTED
## MADRAS
(From 17.4.90 to 30.4.90)

AMPICILLIN SODIUM STERILE: From Spain: T.T.K. Pharma Ltd., 500 Kgs., Rs. 6,41,139.

AMPICILLIN SODIUM STERILE BP/USP: From Cyprus: Tamil Nadu Dadha Pharm. Ltd., 106 Kgs., Rs. 1,52,948.

BENZALDEHYDE FFC: From Netherlands: Malladi Drugs & Pharm, 15,600 Kgs., Rs. 5,18,131.

CITRIC ACID MONOHYDRATE BP: From Hong Kong: Kothari Photo Chemicals Intl., 50 Kgs., Rs. 742.

4-CYANO PYRIDINE: From Japan: Chandak Labs. Pvt. Ltd., 10,000 Kgs., Rs. 8,60,254.

DIMETHYL ACETAMIDE: From FRG: TTK Pharma Ltd., 1520 Kgs., Rs. 56,401.

ERYTHROMYCIN THIOCYANTE: From Italy: Pradeep Drug Co., 1241.78 Kgs., Rs. 15,02,331.

ETHISTERONE: From USA: Tamil Nadu Dadha Pharm. Ltd., 100 Kgs., Rs. 4,58,090.

LACTOSE USP: From Netherlands: Tamil Nadu Dadha Pharm. Ltd., 12,000 Kgs., Rs. 1,82,586.

D-PARA HYDROXY PHENYL GLYCINE: From Singapore: TTK Pharma, 2,000 Kgs., Rs. 7,67,862.

## PLASTIC MATERIALS IMPORTED
## BOMBAY
7.5.90

HDPE: From Argentina: National Plastic Industries, 140 Mts., Rs. 21,98,877; From Canada: Pan Asia Intl. Pvt. Ltd., 16.25 Mts., Rs. 2,02,537; From Czechoslovakia: Naresa Traders, 12.5 Mts., Rs., 1,42,031; Parkesh Traders, 25 Mts., Rs. 2,23,462; Hardik Industrial Corpn., 12.5 Mts., Rs. 1,42,031; Hardik Inds. Corpn., 37.5 Mts., Rs. 4,26,093; From Japan: Arun Polymers Ltd., 50 Mts., Rs. 8,41,124; From Korea: Neosack Ltd., 20 Mts., Rs. 3,08,190; Neosack Ltd., 28 Mts., Rs. 4,31,464; Olympic Synthetic Sacks Pvt. Ltd., 33.64 Mts., Rs. 1,04,870; From Korea: Plastotex, Bombay, 20 Mts., Rs. 3,04,824; From Saudi Arabia: Amar Plastics, 51.45 Mts., Rs. 7,72,170; Amar Plastics, 137.20 Mts., Rs. 20,57,320; Associated Plastics Inds., 17.15 Mts., Rs. 2,70,659; Pai Real Estate, 17.15 Mts., Rs. 2,72,356; Pai-Asia Intl. Pvt. Ltd., 148.5 Mts., Rs. 2,01,544; Danel Dhilips & Co. Pvt. Ltd., 33,000 Kgs., Rs. 4,95,271; Plastotex Pvt. Ltd., 10 Mts., Rs. 1,52,412; Plastotex Bombay, 10 Mts., Rs. 1,52,412; Ravi International, 17.15 Mts., Rs. 2,78,618; Southern Blow Moulders, 34.3 Mts., Rs. 5,41,718; Vallabh Polymers Ind. Pvt. Ltd., 17.15 Mts., Rs. 2,87,320; From USA: Associated

Plastic Industries, 40 Mts., Rs. 5,20,052; From USA: Southern Marketing Association, 15 Mts., Rs. 2,18,108; From Yugoslavia: Fortuna Agenics, 10,000 Kgs., Rs. 1,25,490; Fortuna Agencies, 20,000 Kgs., Rs. 3,13,725; Ravi International, 14 Mts., Rs. 2,36,735

HDPE RESIN/GRANULES: From Saudi Arabia: Pyarelal India, 17.15 Mts., Rs. 2,64,873.

HDPE RESIN: From Japan: Gujarat Ambica Cements, 66 Mts., Rs. 11,32,032; From Japan: Jai Fibres Ltd., 16.5 Mts., Rs. 2,60,276; From FRG: Joshi Formables Ltd., 5,000 Kgs., Rs. 2,33,769.

LDPE: From Finland: Amotex Cables Ltd., 32 Mts., Rs. 5,61,977; From France: Finolex Cables, 77.16 Mts., Rs. 3,82,534; From USA: Hind Polymers, 63.741 Mts., Rs. 6,84,877; From Yugoslavia: Mayant Chemical Plast Pvt. Ltd., 9 Mts., Rs. 13,143; Raheja Mercantile Corpn., 3 Mts., Rs. 4,34,556; Saawyark Udyog, 18 Mts., Rs. 2,64,540.

PHENOLIC RESINS: From Finland: Century Laminating Ltd., 706 Kgs., Rs. 26,877.

POLYACETATE RESIN: From Japan: R. Raheja Exports Pvt. Ltd., 17 Mts., Rs. 6,23,015.

POLYETHYLENE GRANULES: From Netherlands: Angel Plastics Ltd., 15 Mts., Rs. 2,22,505.

POLYETHYLENE RESIN: From FRG: Cove Parenterals Ltd., 90,000 Kgs., Rs. 5,61,977.

POLYOL POLYETHER: From USA: Bharat Foam Udyog Pvt. Ltd., 16.38 Mts., Rs. 3,12,438.

POLYPROPYLENE: From Australia: Hindustan Pulp Udyog Ltd., 105 Mts., Rs. 15,77,996; From Belgium: Paneramma Plastics, 22.5 Mts., Rs. 3,37,686; From Canada: Bhatra Agencies, 60 Mts., Rs. 8,79,552; Harkab Holdings Pvt. Ltd., 30 Mts., Rs. 4,29,776; From Czechoslovakia Associated Brothers, 14 Mts., Rs. 1,39,986; Associated Plastic Industries, 28 Mts., Rs. 2,86,336; From Japan: J-Hico Products Ltd., 8 Mts., Rs. 1,74,514; Paharpur Plastics, 150 Mts., Rs. 21,00,275; From USA: Associated Plastic Industries, 17 Mts., Rs.. 1,92,889; Dharpur Plastics, 180 Mts., Rs. 25,19,433; Pan Asia Intl. Pvt. Ltd., 17.75 Mts., Rs. 1,98,346; United Impex Corpn., 16.25 Mts., Rs. 2,05,600; From Yugoslavia: Sunil Plastic Industries, 15 Mts., Rs. 2,56,605.

POLYPROPYLENE HOMOPOLYMER: From Canada: Bhatia Agencies, 45 Mts., Rs. 6,59,654; K. Raheja Mercantile Corpn., 45 Mts., Rs. 6,00,765.

POLYPROPYLENE MOULDING POWDER: From USA: Vipul Plastic Pvt. Ltd., 16.783 Mts., Rs. 2,19,676.

POLYPROPYLENE RESIN: From Korea: Thermopack Industries, 12 Mts., Rs. 2,19,888.

POLYSTRYENE: From Korea: Delux Sales Corpn., 9 Mts., Rs. 99,453; Delux Sales Corpn., 17 Mts., Rs. 2,46,422; Godrej Boyce Mfg. Co. Ltd., 68 Mts., Rs. 15,18,970; The Supreme Industries Ltd., 17 Mts., Rs. 2,22,114; From Korea: The Supreme Industries Ltd., 68 Mts., Rs. 9,35,218; The Supreme Industries Ltd., 102 Mts., Rs. 23,14,056.

POLYSTYRENE POLYSTYROL: From Korea: The Supreme Industries Ltd., 34 Mts., Rs. 4,67,608.

PVC: From Brazil: Amar Plastics, 100 Mts., Rs. 11,77,970.

PVC RESIN: From Brazil: Auto Plast, 25 Mts., Rs. 2,75,914; From Saudi Arabia: Raj Ripes Ltd., 200 Mts., Rs. 23,48,854; From USA: Bombay Battery Separators, 20,412 Kgs., Rs. 4,77,078.

PVC RESIN PASTE: From Taiwan: Royal Cushion Vinyl Products, 52.5 Mts., Rs. 9,95,038.

FILTER CLOTHS
FILTER CLOTHS

In Cotton. Nylon. Acrylic polyester Fibre polypropylene.
P.V.A., P.V.C. are manufactured in over 400 Varieties
and also Supplied as per your specifications and requirements. prices are competitive.
Our full-fledged technical department is ready to assist you.

Please contact for further details and sample.

**BHARAT INDUSTRIAL CORPORATION**
TELEX: 011-72262 DRAG IN.
90, BHAJIPALA LANE TAVAWALA, BLDG. BOMBAY 400 003.
GRAM: "BHARATTUBE", BOMBAY - 400 003.
PHONE: 341920, 341869, 335759 ■ RESI.: 5134142

PVC SHEETS: From Canada: Chandra Plastics, 13,050 Meters, Rs. 72,867.

PTFE RESIN: From Japan: Mechanical Packing Inds. Ltd., 1 Mt., Rs. 2,25,123.

VINYL RESIN: From USA: Western Components Ltd., 5.085 Mts., Rs. 3,53,391.

---

## MATERIALS IMPORTED MADRAS (From 16.6.90 to 30.6.90)

---

ACETYL SULPHANILYL CHLORIDE: From Japan SOL Pharmaceuticals Ltd., 30,000 Kgs., Rs. 13,25,415.

ALUMINIUM OXIDE SP: From Hong Kong: Carborundum Universal Ltd., 20 Mts., Rs. 1,88,476.

AMMONIUM PERSULPHATE: From FRG: Triton Valves Ltd., 1,000 Kgs., Rs. 25,252.

AROMATIC CHEMICALS: From FRG: Mahendra Perfumery Works, 115 Kgs., Rs. 41,737; From Japan: Bush Boake Allen (I) Ltd., 175 Kgs., Rs. 90,499; From Switzerland: The Mysore State Agar. Ltd., 230 Kgs., Rs. 1,24,564; From UK: Bush Boake Allen (I) Ltd., 125.8 Kgs., Rs. 9,74,363.

BENZALDEHYDE: From USA: Malladi Drugs & Pharm., 16,800 Kgs., Rs. 4,80,444.

BISPHENOL A: From Japan : SIP Resins Ltd., 64,000 Kgs., Rs. 14,88,940.

BUTANOL: From Singapore: Peacock Polymers Pvt. Ltd., 60 Nos., Rs. 1,48,554.

TERTIARY BUTYL ALCOHOL: From Japan: Aswathi Chemicals Pvt. Ltd., 6.2 Mts., Rs. 1,46,501.

TERTIARY BUTYLAMINE: From Belgium: TPS Labs Ltd., 20 Mts., Rs. 10,00,006.

CALCIUM SILICIDE: From FRG: Metalpowder Co. Ltd., 20 Mts, Rs. 10,00,006.

CAPROLACTAM: From Netherlands: SRF Ltd., 128 Mts., Rs. 37,97,426.

3 CHLORO 4 FLUOROANILINE: From China: Dr. Reddy's Labs. Ltd., 10 Mts., Rs. 29,40,562; From Japan: Reddy's Labs. Ltd., 1999 Kgs., Rs. 10,22,495.

2 CHLORO PROPIONIC ACID: From UK: Biochem Inds., 40 Mts., Rs. 7,97,180.

CITRIC ACID BP 80: From China: Aarkay Impex: 20,000 Kgs., Rs. 2,90,191.

META CRESOL 99%: From Japan: Aswathi Chemicals Pvt. Ltd., 8 Mts., Rs. 3,99,288.

CYANOPYRIDINE 90%: From Japan: Veer Chemie & Aromatics Pvt. Ltd., 12 Mts., Rs. 10,46,086.

CYSTEAMINE HCL: From Japan: Globe Organics Ltd., 16,000 Kgs., Rs. 16.46.423

DESMODUR: From FRG: Art Print Rollers, 160 Kgs., Rs. 26,723.

DIAPYRIDANOL: From Hong Kong: Ramakrishna Organics Pvt. Ltd., 100 Kgs.., Rs. 1,03,705.

DIETHANOLAMINE: From Japan: Jheelani Tanning Inds., 1,323 Kgs., Rs. 2,55,970.

DIHYDROXY BENZOIC ACID: From FRG: Reckitt & Colman of India Ltd., 500 Kgs., Rs. 2,89,579.

DIMETHYL CARBONATE: From France: Eskayef Ltd., 15,600 Kgs., Rs. 6,07,086.

ETHOXY METHYLENE MALONIC ACID: From France: Thomson Drugs & Chemicals, 3,060 Kgs., Rs. 6,58,877.

ETHYL AMINE: From FRG: Shivasakthi Enterprises, 16,380 Kgs., Rs. 1,97,311.

EHTYL GLYCOL: From FRG: Khazar Hussain & Sons., 5,472 Kgs.,

**For Your Regular Requirements Of:**

**PHENOL**

Please Contact

**SONKAMAL ENTERPRISES**

9, Khimji Meghji House, 11/15, Issaji Street,
Vadgadi, Bombay 400 003.

**Phones: Office: 330352/344797 Resi.: 6367846**

Rs. 1,54,686.

ETHYL VANILLIN: From France: Bush Boake Allen (I) Ltd., 500 Kgs., Rs. 2,25,996.

EUGENOL: From Indonesia: Dinamit Enterprises, 250 Kgs., Rs. 12,133.

GAMMA FERRIC OXIDE: From Hong Kong: Murugappa Elect. Ltd., 4,989.6 Kgs., Rs. 2,01,401; Nova Magnetics Ltd., 250 Kgs., Rs. 19,678.

GUETHOL: From Japan: Reckitt & Colman of India Ltd., 2,000 Kgs., Rs. 2,33,049.

HYDRAZINE HYDRATE: From USA: Veer Chemie & Aromatic Pvt. Ltd., 5,000 Kgs., Rs. 1,65,709.

HYDROXYLAMINE SULPHATE: From FRG: Standard Organics Ltd., 10,000 Kgs., Rs. 4,14,645.

IODINE CRUDE 99.5%: From Japan: Eskayef Ltd., 3,000 Kgs., Rs. 8,63,844.

ISOBORNYL ACETATE: From GDR: Krystal Chemicals Pvt. Ltd., 1,00,000 Kgs., Rs. 20,20,000.

ISOBUTYL BENZENE: From USA: Cheminor Drugs Ltd., 1,09,245 Kgs., Rs. 61,01,290; Shasun Drugs, 13,657 Kgs., Rs. 7,86,502.

ISOPROPYL ALCOHOL: From Singapore: Peacock Polymers Pvt. Ltd., 30 Nos., Rs. 61,170.

LAB CHEMICALS: From UK: Appollo Hospitals Enterprises, 50 Kgs., Rs. 31,108.

LINALOOL: From USA: Mysore Sugandhi Dhoom Factory, 544 Kgs., Rs. 70,252.

LINALYL ACETATE: From Switzerland: Bush Boake Allen (I) Ltd., 715 Kgs., Rs. 1,52,144.

2-MERCAPTOBENZIMIDAZOLE: From Japan: SRF Ltd., 2,600 Kgs., Rs. 4,02,742.

MERCURY METAL: From Japan: Ponds India, 20 Nos. Rs. 1,04,709.

METHYL ACETOACETI ESTER: From Japan: Shivashak Enterprises, 30,660 Kgs., Rs. 3,37,308

METHYL CEDRYL KETONE From UK: Padmini Products, 800 Kgs. Rs. 2,79,222.

METHYLENE CHLORIDE: From France: TTK Pharma Limited, 19,00 Kgs., Rs. 1,95,630; From Netherlands: SOL Pharm Limited, 19,890 Kgs., Rs. 2,23,879.

MURIATE OF POTASH: From FRG: Ministry of Agriculture, 25,000 Mts., Rs. 6,30,57,738.

MUSK KETONE: From FRG: The Chemical Engg. Corpn., 100 Kgs., Rs. 59,092.

NAPTHALENE CRUDE: From Canada: Chennai Inorganics Pvt. Ltd., 31,200 Kgs., Rs. 2,58,630.

D ALPHA PHENYL GLYCINE BASE: From Spain: TTK Pharma Ltd., 3,000 Kgs., Rs. 3,37,667.

PARAHYDROXY PHENYL ACETAMIDE: From Japan: Meridian Pharmls. Pvt. Ltd., 210 Kgs., Rs. 1,69,116.

PHOSPHORIC ACID: From USA: Madras Fertilisers Ltd., 5,326 Mts., Rs. 3,59,94,048.

POLYVINYL ALCOHOL: From Singapore: Veenus Textiles, 7,000 Kgs., Rs. 2,32,104.

POTASSIUM CHLORIDE: From FRG: Standard Alkali, 6000 Mts., Rs. 1,38,35,226.

PROPYLENE DICHLORIDE: From Italy: UB Petroproducts Ltd., 74 Kgs., Rs. 1,025.

PROPYLENE GLYCOL: From USA: Kesarimal, 23.54 Mts., Rs. 5,53,128.

PYRIDINE: From Japan: Priya Chemicals, 3,900 Kgs., Rs. 2,02,451; Priya Elect & Chemicals, 1,560 Kgs. Rs. 1,12,900.

**Available Directly From Manufacturers:**

**O-TOLUIC ACID**
**O-CHLORO BENZOIC ACID**
**PARA CHLORO BENZOIC ACID**
**DICHLORO BENZOIC ACID**
**O-CHLORO BENZALDEHYDE**
**PARA HYDROXY BENZALDEHYDE**
**PARA CHLORO BENZALDEHYDE**
**PARA CHLORO META CRESOL**
**PARA ANISALDEHYDE**
**CINNAMIC ALDEHYDE**
**CINNAMIC ALCOHOL**

Please Contact:

**BOX NO. 1253**

**CHEMICAL WEEKLY**
306, Shri Hanuman Industrial Estate,
G.D. Ambekar Road, Wadala,
Bombay 400 031.

ROCK PHOSPHATE: From Jordan: Ganges Fertiliser & Chemicals, 2,500 Mts., Rs. 28,64,512; Shaw Wallace Co. Ltd., 5,000 Mts., Rs. 57,29,029.

SILICON METAL: From Brazil: The Metal Produce Co. Limited, 20 Mts., Rs. 4,60,618; From USA: India Pistons Limited, 10 Mts., Rs. 4,34,749.

SODIUM BORATE: From Turkey: Bhansali Chemicals Mfg. Ltd., 275 Mts., Rs. 16,44,836.

SODIUM BOROHYDRIDE: From Finland: Neuland Labs. Ltd., 300 Kgs., Rs. 2,24,076.

SODIUM CRUDE: From Turkey: Borax India Pvt. Ltd., 250 Mts., Rs. 14,76,578.

SODIUM FORMATE: From Italy: Shanti Chemicals, 1000 Kgs., Rs. 3,316; From Japan: Shanti Chemicals, 10 Mts., Rs. 63,004.

SODIUM NITRATE 99%: From Hong Kong: Shivshakti Trading Corpn., 15,500 Kgs., Rs. 67,624.

SODIUM LECITHIN: From USA: SPIC Electronics Sys. Ltd., 349 Kgs., Rs. 46,104.

SULPHUR: From Poland: EID Parry India Ltd., 4000 Mts., Rs. 95,34,142; From Poland: Kamer Chemicals & India Ltd., 2,000 Mts., Rs. 47,82,520; From UK: Fenners India Ltd., 1 Mt., Rs. 22,448.

SULPHUR HEXA FLUORIDE: From UK: Department of Atomic Engg., 204 Kgs., Rs. 76,328.

TITANIUM DIOXIDE: From Singapore: Peacock Polymers, 80 Nos., Rs. 1,01,927.

TRICHLOROSALICYLIC ACID: From UK: ICI India Ltd., 13,860 Kgs., Rs. 36,56,643.

TRIMETHOXY BENZALDEHYDE: From China: Prasad Drugs Private Limited, 2,000 Kgs., Rs. 8,02,765; From Netherlands: Standard Organics Limited, 6,020 Kgs., Rs. 26,06,475.

VANILLIN: From Switzerland: Siva Shakti Perfumery Works, 350 Kgs., Rs. 43,632; From USA: Bush Boake Allen (I) Ltd., 1600 Kgs., Rs. 3,79,569.

ZINC HIGH GRADE: From Australia: Transpek Industry Ltd., 1,520 Nos., Rs. 11,53,468.

ZIRCONIUM SILICATE: From Japan: Spartek Ceramics Ltd., 36 Mts., Rs. 8,53,634.

---

## MATERIALS EXPORTED BOMBAY

**5.3.90**

ALUMINIUM CHLORIDE: To Genova: Kline Chemicals Pvt. Ltd., 16,800 Kgs., Rs. 2,89,160.

META AMINO PHENOL: To London: HOC Ltd., 5,000 Kgs., Rs. 8,93,617.

CATECHOL TECH: To Hong Kong: Rallis India Ltd., 15 Mts., Rs. 18,76,596.

CYPERMETHRIN TECH: To Genova: Rallis India Ltd., 500 Kgs., Rs. 3,87,000.

DIMETHYL SULPHATE: To Barcelona: Salvigor Labs Pvt. Ltd., 18,000 Kgs., Rs. 2,20,000.

ENDOSULPHAN TECH: To Barcelona: Excel Inds. Ltd., 3,200 Kgs., Rs. 16,63,327.

ERYTHROXYCIN METAL: To Toronto: Mehta Pharma Internatinal, 100 Kgs., Rs. 15,50,000.

ETHION TECH 95%: To Keelung: Rallis India Ltd., 3,000 Kgs., Rs. 2,76,000.

SODIUM FORMALDEHYDE SULPHOXYLATE TECH: To Laspezia: Transpek Industry Ltd., 9,000 Kgs., Rs. 2,55,319.

SODIUM HYDROSULPHATE 88.9%: To Charleston: Transpek Industry Limited, 36,288 Kgs., Rs. 7,04,000.

AVAILABLE
PELLETS
Now For The First Time In Particular Shape & Size
Potassium Hydroxide
(IP/Pharma Grade)
Sodium Hydroxide
AR/IP/Pharma Grade)
Manufactured by
**M/s. Kaamakhya Chemicals,**
Ludhiana
**Best Quality**
Prepared from selected Raw-Materials
Perfectly Standardized
Passes through rigid Control tests
of uniform superior quality
Available in attractive & Protective packings
at competitive rates
CONTACT
V. Tribhovandas
Ranvir Mansion
66/70. Shamaldas Gandhi Marg, Bombay-400 002
Gram · IODOFORM Phones : 25 91 36/ 317209/ 318821
TELEX : 1182812-VT IN

Manufacturers of Quality "TIN" products, Now Introduces "LR/AR" Grades of

CADMIUM SALTS
(Acetate, Chloride, Carbonate, Nitrate, Oxide, Sulphate)
MANGANESE ACETATE
NICKEL SULPHATE AND CARBONATE
FLUOBORATE OF TIN, LEAD, COPPER AND CADMIUM
TIN SALTS (Chloride, Oxide and Sulphate)

**SRI INDUSTRIAL CHEMICALS**

C-1/B-49, LIC Sector, Behind Haria Garments, G.I.D.C., Silvassa Road, Vapi - 396 195.
*Office:* 7/10, Botawala Building, 3rd Floor, Room No. 3, Horniman Circle, Bombay 400 023, India.
**Hello: Off: 2860074/0045; Resi: 6120167/383427/367429**

**Contact For Your Requirements of**

**ERYTHROMYCIN ESTOLATE I.P.**
**ERYTHROMYCIN STEARATE I.P.**
**RIBOFLAVINE PHOSPHATE SODIUM I.P.**

MANUFACTURED BY :

Sanjivani

DRUGS AND PHARMACEUTICALS

PLOT NO. 617, PHASE IV, BEHIND NEEKA TUBES, G.I.D.C., VATVA,
AHMEDABAD-382 445. PHONES : (O) 831673, 830851. (R) 413773

FOUNTAINHEAD

**WE MANUFACTURE AS PER SPECIFICATION**

(1) SODIUM SILICATE ALKALINE & NEUTRAL
LIQUID AND LUMP ALSO IRON FREE
(2) POTASSIUM SILICATE
(3) SODIUM META SILICATE $9H_2O$ & $5H_2O$

SCI

**SAPANA CHEMICAL INDUSTRIES**

19, BARODA CO-OPERATIVE INDUSTRIAL ESTATE,
CHHANI ROAD, BARODA- 390 002
PHONES : (F) 21950 (R) 21911

## SILICA GEL

(a) Indicative Type
(b) Non-Indicative Type
(c) Powder upto 400 Mesh

The product meet all Physical and Chemical analysis of imported Silica Gel

## PRECIPITATED SILICA

of High Purity suitable to
(a) Rubber
(b) Pesticides
(c) etc.

| | |
|---|---|
| Description | Almost colourless crystals |
| Silica as $SiO_2$ | 99.18% w/w |
| Iron as $Fe_2O_3$ | 0.025% w/w |
| Aluminium as $Al_2O_3$ | 0.025% w/w |
| Calcium as CaO | Negligible |
| Sodium as $Na_2O$ | Negligible |
| Titanium as $TiO_2$ | Negligible |
| Bulk Density | 0.7407 gm. |
| Water Adsorption | |
| at 80% RH | 36.85% w/w |
| at 60% RH | 30.59% w/w |
| at 50% RH | 29.00% w/w |
| at 40% RH | 26.53% w/w |
| at 20% RH | 22.87% w/w |

## HARCHEM

*Factory:* E-7(A) Road No. 1, Vishwakarma Ind. Area, Jaipur-302 013. **Phone: 832865**
*Bombay Office:* 29, Merry Land, R.G. Thadani Marg, Worli, Bombay 400 018.
**Ph: 4939641**

---

*READILY AVAILABLE*

| | |
|---|---|
| M.E.K. PEROXIDE | METHYL ETHYL KETONE PEROXIDE |
| B.P. POWDER | BENZOYL PEROXIDE POWDER |
| B.P. PASTE | BENZOYL PEROXIDE PASTE |
| T.B.H.P. | TERTIARY BUTYL HYDRO PEROXIDE |
| D.T.B.P. | DI TERT BUTYL PEROXIDE |
| T.B.P.B. | TERTIARY BUTYL PER BENZOATE |
| L.P.O. | LAURYL PEROXIDE |
| C.H.P. | CYCLO HEXANONE PEROXIDE |

Please Contact:

## SHEIRAJ CHEMICALS & PHARMACEUTICALS PVT. LTD.

*Office:* 503-A, Stock Exchange Building, 5th Floor, Dalal Street, Bombay 400 023.
**Phone: 272451/275545. Telex: 5900 GURU IN.**
*Factory:* W-265, T.T.C. Industrial Area, Rabale, Thane (M.S.)

---

# BENZOYL PEROXIDE

We supply Excellent Quality
Quality Cautious Consumers for your Bulk Requirement

Contact Manufacturers

## ROMA CHEM INDUSTRIES

Regd. Office: 22/1044, Punjabi Colony,
G.T.B. Nagar, Bombay 400 037.
**Phones: 4073074/4092216/4093914 Resi: 483095**

**Sales Office:** Municipal Bldg., C-1, Shop No. 2 & 3,
Near Sardar Nagar No. 4, G.T.B. Nagar, Bombay 400 037.

FERROUS SULPHATE
FERROUS AMMONIUM SULPHATE
MAGNESIUM SULPHATE
MANGANESE SULPHATE
NICKEL SULPHATE
POTASSIUM NITRATE
STRONTIUM CHLORIDE
ZINC CARBONATE
ZINC OXIDE
ZINC SULPHATE

**L C TRADERS**
(Chemicals Division)
403, "YOGESHWAR"
135/139, Kazi Sayed Street, Bombay 3.
Tel.: Off.: 331195/326542
Grams: "SULPHATES" — Chinch Bunder

WANTED

**TECHNICAL KNOW-HOW FOR**

**ALUMINIUM CHLORIDE ANHYDROUS**
**POWDER AND GRANULES**

**Persons having actual plant experience preferred**
Interested parties contact at:

**BOX NO. 1261**
**CHEMICAL WEEKLY**
306, Shri Hanuman Industrial Estate,
G.D. Ambekar Road, Wadala, Bombay 400 031.

**BARIUM CARBONATE - 98% Min**

**Available Ex-Stocks in Truck Loads**
**At Rs. 13.00 per Kg + Taxes**

(Subject to our final confirmation & without engagement)

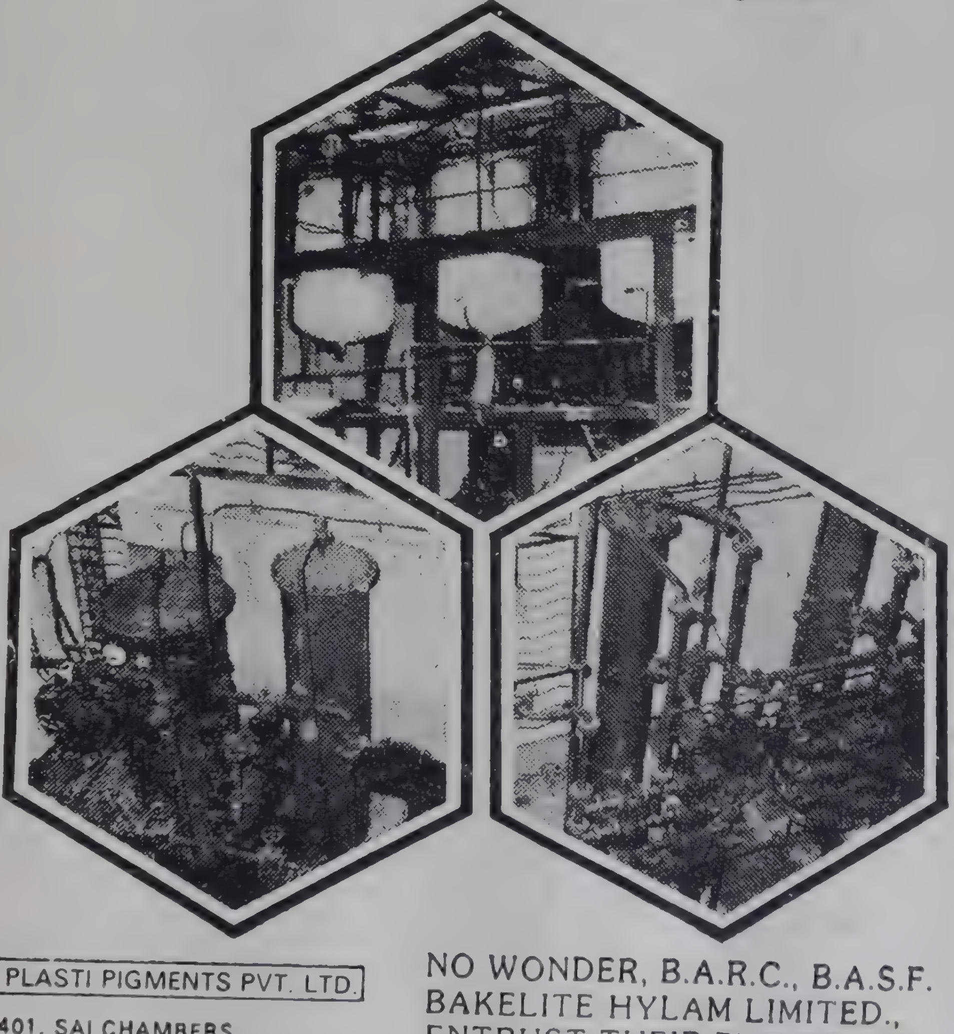
**VORA CHEMI TRADE**
**PVT. LTD.**

265, Samuel Street, Bombay 400 003.
Phones: 333762/63/64/325265/345377

**When you consider the lengths PPPL goes to give service with good quality, everything it manufactures is surprisingly economical.**

Manufacturers of :

Benzoyl Peroxide
Powder & Paste form.
Methyl Ethyl Ketone Peroxide.
Tertiary Butyl Hydro Peroxide.
Tertiary Butyl Per Benzoate.
Di-Tertiary Butyl Peroxide.
Cyclohexanone Peroxide.
M.I.B.K. Peroxide.
Synthetic Pearl Essence
various grades.



PLASTI PIGMENTS PVT. LTD.

401, SAI CHAMBERS,
365/367, NARSI NATHA STREET,
BOMBAY-400 009.
Tel : 337890-343688

NO WONDER, B.A.R.C., B.A.S.F. BAKELITE HYLAM LIMITED., ENTRUST THEIR ENTIRE REQUIREMENT OF PEROXIDE CATALYSTS TO PLASTI PIGMENTS.

WHERE SERVICE IS A WAY OF LIFE

# THE PEOPLE WITH CHEMICAL VISION

- DESIZING AGENTS
- WETTING AGENTS & DETERGENTS
- RESINS UF DMEU DMDHEU HVS ATE AMH MF
- NONIONIC SOFTENERS
- ANIONIC SOFTENERS
- CATIONIC SOFTENERS
- REACTIVE SOFTENERS
- WAX EMULSIONS
- EMULSIFYERS
- ANTIRUBBING AGENT
- POLYETHYLENE EMULSION
- ANTISTATIC AGENTS
- STAIN REMOVING AGENTS
- LEVEL DYEING AGENT
- DISPERSING AGENT
- SIZE SOFTENERS
- CHELLATING AGENTS
- DEFOAMER
- GUMS
- TURKEY RED OIL
- SOLVENTS
- ANTI-MILDEWING AGENTS
- SILICON EMULSION
- CARRIERS
- MERCERISING AGENT
- POLYVINYL ACETATE EMULSION
- WOOL BATCHING OIL
- BINDERS
- MANY OTHER PRODUCTS FOR VARIOUS INDUSTRIES

CHEMOX ®
INDUSTRIAL CORP

Our fully equipped & Modernised Factory at Saki-Vihar lake Road, Powai, Bombay.

Manufactured by:

Chemox®

**CHEMOX® INDUSTRIAL CORPORATION**

Noble Chambers, 4th Floor, A.S.Brelvi Road, Bombay 400 001.
Cables: "GLYCOPRIT"
Phones: Office: 287 01 33 • 287 41 19
Factories:
Saki Naka, Powai: 58 44 87 • 58 69 86

**TRADE MARK CAUTION NOTICE**
"CHEMOX" IS THE Registered Trade mark of
Chemox Industrial Corporation under Reg
No. 322485 in class 1st.
unauthorised use by any other pe
nal offence punishable impri
and/ or Fine.

35th
YEAR OF
PUBLICATION

# Chemical Weekly

VOL. XXXV
AUGUST 28, 1990
NO. 51

C.F.T.R.I., MYSORE
AUG [illegible]

THE SYMBOL OF PURITY IN INDUSTRIAL SOLVENTS
COSMETICS
ELECTRONICS
SURFACE COATINGS
DRUGS & PHARMACEUTICALS
NOCIL
Authorised Distributor

International Solvents & Chemical Company offers naked products at competitive prices ex-Thane Godown from four separate filling points. Of-course, ISC continues to supply original barrels of these NOCIL CHEMICALS: IPA-CBM, NBA, OCTANOL, Acetone, DIACETONE, DAA, MIBK, IBA, EDC, Isopropanol, Butanol, 2-Ethyl Hexanol, MEG, DEG and Polyethylene Glycol 200/300/400/600/1500, CELLOSOLVE, CARBITOL, Sanotol EAU & EGU (mixture of Polyethylene Glycol ethers)

For Your Requirements Please Contact
International Solvent & Chemical Co.
85, NARIMAN BHAVAN OPP HOECHST HOUSE 227, NARIMAN POINT BOMBAY-400 021 TEL 2028162/2024774

*Where Quantity & Quality Matter*
*always Count on....*

KC
KRIPA'S

ACID SLURRY

SODIUM LAURYL SULPHATE
(POWDER, NEEDLES & LIQUID)

SODIUM LAURYL ETHOXY SULPHATE

INDUSTRIAL DETERGENT 40%
HOUSE HOLD DETERGENT POWDER
SPRAY DRIED - 25 Kgs. BULK PACKING

KC
KRIPA'S

**KRIPA CHEMICALS PVT. LTD.**

**Admn. Office:**
8/9/10 'Royal Chambers'
S. No. 47, Paud Rd., PUNE-411038
**Phones; 333245, 331825, 331855**
**Telex: 0145-729 KRIPIN**

**Branch Office:**
House No. 1024, 10th Main Road,
West of Chord Road, IIIrd Stage, 1st Block,
Bangalore-560079 **Phone: 357393**

PRINT-DESIGN

SEE PAGE 39 FOR CONTENTS

SILICA GEL
(INDICATING/NON-INDICATING/COLUMN CHROMATOGRAPHY/THIN LAYER CHROMATOGRAPHY
ACTIVATED CARBON
(POWDER/GRANULAR; CHEMICALLY ACTIVATED)
PRECIPITATED SILICA
(RUBBER GRADE/INSECTICIDE GRADE)

BUTYL STEARATE
METHYL OLEATE
COCOAMINE OXIDE
COCO DI ETHANOLAMIDE
COCO MONO ETHANOLAMIDE
COCO AMIDOPROPYL BETAINE
OCTYL STEARATE
PARA CHLORO ANILINE
COCO BETAINE
BENZALKONIUM CHLORIDE

ORTHO DICHLORO BENZENE
PARA DICHLORO BENZENE
ORTHO PHENYLENE DIAMINE

MONO CHLORO BENZENE
TRI CHLORO BENZENE
BENZYL CHLORIDE

ISO PROPYL MYRISTATE
ISO PROPYL PALMITATE
ISO PROPYL ALCOHOL
DIOCTYL SULPHO SUCCINATE LIQUID

DRIER CHEMICALS

100, Dada Saheb Phalke Road,
Dadar (East),
BOMBAY 400 014 (INDIA)

Tel.: 4111051-4111661
Resi.: 4221658

Please Contact for Prompt Supplies Of:

**Anhydrous Ammonia Gas**

**IN CYLINDERS AND ROAD TANKERS**

**Also Available LIQUOR AMMONIA in Carboys and Tankers**

***Surat Ammonia Supply Company***

105, Regent Towers, Race Course Circle, Baroda 390 007.
**Phones: 323827, 321897 & 320676 * Gram: SASCO * Telex: 0175-497 SASC-IN**

**Ahmedabad Office:** M.H. ENTERPRISES, Plot No. 2018, GIDC, Vatva Phase II, Ahmedabad.
**Tel. No. Office: 336279, 348873**

**Ankleshwar Office:** J-3435, G.I.D.C. Estate, Ankleshwar-393 002, Gujarat State. **Phone: 2449.**

**Hyderabad Office:** SUPERCHEM AGENCIES, Godown No. 1, Behind Bakelite Hylam, Industrial Estate,
Sanathnagar, Hyderabad-500 018. **Telephone No. 263812.**

**Poona Office:** POONA GAS & CHEMICAL CO., Ratnakar, 8/16, Karve Road, Poona-411 004.
**Phones: 431110, 420330, 421695.**

**Vapi Office:** Shed No. 19, C-1, B. Type, Vapi Industrial Estate, G.I.D.C., Vapi-396 195. **Phone: 685.**

***BOMBAY AMMONIA & CHEMICAL CO.,***

204, B-Wing, Neelam Centre, 2nd Floor, Hind Cycle Road, Behind Glaxo, Worli, Bombay 400 025.
**Phones: 4948652/4948659/4949544/4946686.**

**The most reliable name in Chemicals**

**DIAMINES**

**International quality** **Indigenously available**

AMINO ETHYL PIPERAZINE (AEP)

Epoxy Curing Agents
Corrosion Inhibitors
Asphalt Additives
Emulsifiers
Pharmaceuticals
Surfactants

For
Rubber and
other Polymers,
Lubricating
and Fuel Additives,
Electroplating,
Mining and Metal Recovery,
Coating and Adhesives,
Surfactants and Softeners.

TETRA ETHYLENEPENTAMINE (TEPA)

PIPERAZINE (PIP) ANHYDROUS

Intermediate for
Pharmaceuticals,
Rubber Accelerators,
Corrosion Inhibitors
and
Surface Active Agents

From the only manufacturers in India

**DIAMINES AND CHEMICALS LIMITED**
International Quality with Indigenous Ingenuity.

**Ahmedabad (H.O) :** 1, National Chambers, Ashram Road
Ahmedabad 380 009 Phone 409626 Gram DIAMINES
**Baroda (Works) :** Plot No 13 P O Petrofils - 391 347, Dist Baroda
Phone 73305/406 Gram DIAMINES Telex 0175 352 DACLIN
**Bombay Office :** 85 'C Wing Mittal Towers, 8th Floor, Nariman Point
Bombay - 400 021. Phone : 2029507. Gram : CELAGAR

Navnit/307/89

AUG 1990
C.F.T.R.I., MYSO

IMPORTED RAW MATERIALS AVAILABLE
WITH **MODVAT & DUTY DRAW BACK** BENEFITS

**PHARMACEUTICALS, COSMETICS FOODS**

- PROPYLENE GLYCOL U.S.P.
- AEROSIL - 200 N.F.
- P.V.P. K-25/30/90 U.S.P.
  (PLASDONE/KOLLIDONE/POVIDONE)
- ETHYL CELLULOSE N.F.
  N-7, 10, 20/22, 45/50, 200
- METHYL CELLULOSE N.F.
  Grades: CULMINAL-MC 400, 4000 CPS
- HYDROXY ETHYL CELLULOSE
  Grades: NATROSOL 250 LR/GR/MR/HBR
- HYDROXY PROPYL CELLULOSE N.F.
  Grades: KLUCEL EF/LF/GF/HF
- HYDROXY PROPYL METHYL CELLULOSE
  U.S.P.-2910
  METHOCEL/PHARMACOAT/METOLOSE
  METHOCEL E3/E5/E15/E50, E-4M, F-4M
  METHOCEL K-100, K-4M, K-15M
  PHARMACOAT 603, 606, 615
- MICROCRYSTALINE CELLULOSE U.S.P./N.F.
  AVICEL PH 101/PH 102/RC-581/RC-591
- CROSSLINKED NaCMC, U.S.P.
  AC-DI-SOL (TABLET DISINTEGRANT)
- SODIUM STARCH GLYCOLATE U.S.P.
- CROSPOVIDONE U.S.P. (DISINTEGRANT)
  KOLLIDONE CL/POLYPLASDONE XL
- SODIUM CARBOXY METHYL CELLULOSE
  (FOOD/DENTAL/U.S.P. GRADES)
- TITANIUM DIOXIDE U.S.P. (SUPERWHITE)
  ANATASE GRADE - BACTERIA CONTROLLED
- CARBOMER/CARBOPOL 934, 940
- VEE GUM/VEE GUM HV
- XANTHAN GUM
- PARA CHLORO META CRESOL B.P.
  (PREVENTOL CMK - CHLOROCRESOL)
- P.E.G. 400/4000/6000/8000
- POLYPROPYLENE GLYCOL (P.P.G.)
- EUDRAGIT (ALL GRADES)
- DL-LACTIC ACID, 88-92%, U.S.P.
- POLYSORBATE (TWEEN 80) U.S.P.
- VANILLIN/ETHYL VANILLIN
- N-METHYL-2-PYRROLIDONE (NMP)
- TERTIARY BUTYL HYDROQUINONE
  (ANTIOXIDANT - T.B.H.Q.)
- OPADRY
- CELLULOSE ACETATE PHTHALATE U.S.P.
- HYDROXY PROPYL METHYL CELLULOSE
  PHTHALATE U.S.P.
- POLYVINYL ACETATE PHTHALATE U.S.P.

**BULK DRUGS INTERMEDIATES**

- TETRAHYDROFURAN
- TERTIARY BUTYL AMINE
- N-PROPANOL PURE (Undenatured)
- HYDROXYLAMINE HYDROCHLORIDE
- ADIPIC ACID
- BENZALDEHYDE

PLEASE CORRESPOND WITH MR. MUKESH KAMDAR / MR. HARISH SHAH
AT

**CROWN CHEMICAL PRODUCTS**

**AT OUR NEW OFFICE ADDRESS**

305-B, NEELAM CENTRE, HIND CYCLE ROAD, WORLI, BOMBAY - 400 025
TELEPHONE: OFFICE: 493 7725, 493 7726, 493 7727, 493 4141
RESI: 409 3892, 407 5245, 646 3287
TELEX : 011-73926 CRWN IN
TELEFAX: 2040390

FOR YOUR REQUIREMENTS FROM READY STOCK:

**CHEMICALS:**

Thiourea
Hyflosupercell
Trichloroethylene
PVC Resin Suspension 67-D
Toshiba Silicon Emulsion TSM-630
Ceto Stearyl Alcohol Alfol 1618-H
Hydrogen Peroxide 20%
Cresylic Acid
Monoethylene Glycol
Methylene Chloride
Methyl Ethyl Ketone
Cellosolve Methyl
Acrylamide
Methyl Isobutyl Ketone
Glyoxal 40%
Peppermint Oil
Beta Picoline
L Lysine Monohydrochloride
Adipic Acid
Gum Rosin N Grade
Portable Generator
Paraformaldehyde 91% & 96%
Butyl Acrylate Monomer
2-Ethyl Hexyl Acrylate
Potassium Carbonate
Low Density Polyethylene
Hydrazine Hydrate 30% & 80%
Ammonium Persulphate
Polyvinyl Alcohol 173 & GH-17
Laboratory & Reagent Chemicals
Methyl Methacrylate
Pentaerythritol
Bromine Liquid
Citric Acid B.P. 80
Isopropyl Alcohol
Diethylene Glycol
Titanium Dioxide B 101
Rangolite 98%
Epichlorohydrine
Thymol Crystal
Cellulose Acetate Scraps

**INTERMEDIATES**

Cyanuric Chloride
Benzaldehyde
Chrome Oxide
N-N-Diethylaniline
Naphthalene Crude
Sodium Formate
Sodium Chromate Yellow

Please Contact:

**GUPTA TRADING COMPANY**
5, Apeejay House, 130, Apollo Street, Fort, BOMBAY - 400 023
Phone Nos. Office: 244403/222059 * Resi: 8229085/8121281
Gram: "CARPEDIUM",

**H-ACID**

**Quality & Reliability**

From:

**SHREEJI COLOUR CHEM INDUSTRIES**
(A Division of Himland Silk Mills Pvt. Ltd.)

**Catering To The Needs of Domestic & Export Markets for over a Decade**

**Works:**
129/1/B, G.I.D.C.,
Nandesari - 391 340,
Dist. BARODA
Tel.: 60214

**Bombay Office:**
Oriental Bank Building,
Office No. 11 B, 2nd Floor,
65, M.G. Road,
Fort, BOMBAY 400 023.
Tel.: 275916.

NOW AVAILABLE:

**96% A.D. DODECYL BENZENE SULPHONATE**
(HARD ACID SLURRY)
**LINEAR ALKYL BENZENE SULPHONATE**
(SOFT ACID SLURRY)
**SULPHONATED WITH SULPHUR TRIOXIDE**

TRADE MARK

MANUFACTURERS:

**Arochem Silvassa Ltd.,**

Industrial Estate, Silvassa 396 230 -- Via Vapi,
Dadra & Nagar Haveli.
**Phone: 289, 291** **Gram: AROCHEM SILVASSA**
**Telex: 0185 201 ARCM IN**

**BOMBAY** : Scent House, Station Road, Goregaon (West), Bombay 400 062.
**Phone: 6722280, Gram: AROSILVASSA,**
**Telex: 011-70038 FAIS IN, Fax: 022-672 0818.**

**KANPUR** : Chemdet Enterprises, Shop 67, 75/232, Sabji Mandi, Kanpur.
**Gram: SCENTOUS, Telephone: 64551.**

**MADRAS** : Syndet Enterprises, 90, Govindappa Naick Street, Madras 600 001.
**Gram: SCENTOUS, Telephone: 569032.**

**DELHI** : B. Shantilal & Co., 1025/5, First Floor, Gali Teliyan, Tilak Bazar, Delhi 110 006.
**Gram: INDOSIL, Telephone: 291 3973.**

*AVAILABLE REGULARLY*

***SPRAY DRIED 40%***
***A.D. ANIONIC DETERGENT***
***POWDER NEUTRAL-pH: 7-7.5***

**In Snow White Colour & Free Flowing**
**Bulk Density below 0.3**

Manufacturers

**Silvassa Syndet Private Limited**

Amli Industrial Estate,
SILVASSA 396 230 -- Via, Vapi,
Dadra & Nagar Haveli.
**Phone: 685**

India's Multinational and Leading Consumers prefer only KGI's Gum
The top quality products
For Your Regular Requirements of:

**Gum Accacia**
(Powder & Crystal)

**Guar Gum**
(Pharma & All Other Grades)

**Gum Tragacanth**
(BPC Standard)

**Gum Arabic * Clove Oil**

WE CAN SUPPLY AS PER NEW I.P. 1985
WITH MICROBIOLOGICAL TEST

Please Contact:

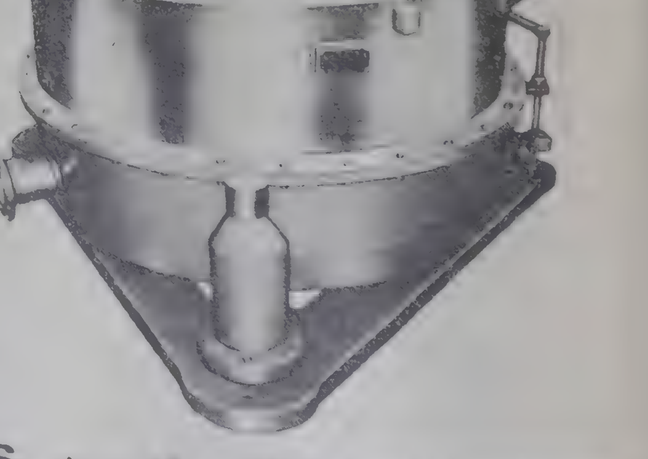
**KAPADIA GUMCHEM INDUSTRIES**

G.P.O. Box No 1160, 3 Mint Road, 2nd Floor, Opp G.P.O., BOMBAY 400 001.
Phones: 2611087/2615073/2617217 Resl.: 6205517/6207028 Gram: PHARMAGUM
Fax No.: 91-22-2612659 Attn.: Mr. RAMESH KAPADIA

Together We Progress

*Introducing*

**NEW 'ROTEX' BOTTOM DISCHARGE CENTRIFUGE**



**With**

1) **Scrapper**
2) **Variable Speed**
3) **Efficient solid discharge system through single outlet in vapour tight condition.**
4) **Basket Dia range from 910 mm to 1520 mm.**

**ALSO AVAILABLE BAGLIFT TYPE AND MANUAL TOP DISCHARGE CENTRIFUGES MADE TO YOUR SPECIFIC REQUIREMENTS.**

**SUKHRAS MACHINES** Associates: **HYDROCHEM ENGINEERS**
Off: 145, Adarsh Industrial Estate, Sahar Road, Chakala, Andheri (E) Bombay 400 099 (INDIA
Tel. 6322721, 6325957 Telex : 011-79179 TAM IN GRAM: 'TAMHYDRO', Andheri, Bombay.

AVAILABLE REGULARLY

**DIETHYL OXALATE**

Please Contact

BAJAJ

**BAJAJ ORGANICS (P) LTD.**

102, Yogeshwar, 135/139, Kazi Sayed Street, Bombay 400 003.
**Telex: 11-75969 BJAJ-IN** **GRAM: CAUSTICLYE**
**Phone: 348406/335133/333171** **Resi.: 653581**

*Branch Office:*

Arunodaya Apartments,
1st Floor,
Room No. J,
7-1-70, Dharam Karan Road, Ameerpet,
HYDERABAD 500 016.
**Phone: 228004/36472**
**Telex: 425-2163 BJAJ IN**
**Gram: CAUSTICLYE**

89, Chandan Society,
Opp. Yashoda Nagar Tekro,
Ahmedabad Bombay Highway,
Yashoda Nagar,
AHMEDABAD.
**Phone: 834546**

CONSUMERS & EXPORTERS CONTACT FOR YOUR REQUIREMENTS OF

DIMETHYL SULPHATE

NOW AVAILABLE IN TANKERS TOO

FOR PROMPT DELIVERY PLEASE CONTACT MANUFACTURERS:

GANESH CHEMICAL INDUSTRIES

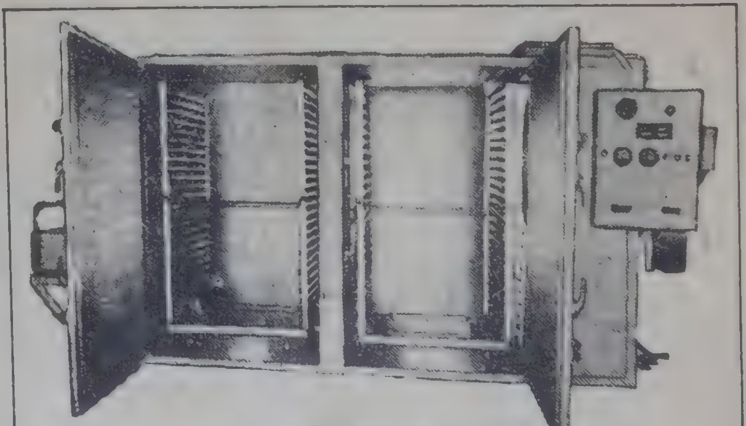
74, Matru Smruti, Road No. 4, Scheme No. 6, Sion (East), Bombay-400 022.

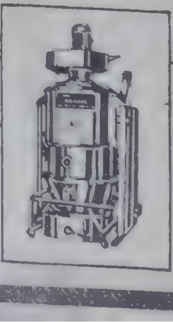
Phone: 4077431/4077432/4077433/4076052

R. SQUAR & CO.

*MANUFACTURERS OF:*

TRAY DRYER, FLUID BED DRYER, DISH ENDS, CENTRIFUGE, GRANULATOR, ICE CRUSHER, PRESSURE VESSELS & OTHER CHEMICAL EQUIPMENTS.





MEET US AT:

R. SQUAR & CO.
M.I.D.C. CHEMICAL ZONE, AMBARNATH-421501.
PHONE: 2785

MANI

*Available in Bulk Quantity and ready stock*

**FRUSEMIDE I.P./B.P.**

**FENBENDAZOLE**

**C.P. MALEATE**

**DIMETHYL AMINO ETHYL CHLORIDE HCL**

**MEBENDAZOLE U.S.P.-22**

**MEBENDAZOLE U.S.P.-22** (White)

**RIFAMPICIN**

**ALBENDAZOLE**

**FLUBENDAZOLE**

**DIMETRIDAZOLE (VET)** (for export)

WANTED LOCAL AGENTS/STOCKISTS IN UNREPRESENTED AREAS

**TRANSCHEM PVT. LTD.**

56, Ridge Road, Malbar Hill, BOMBAY 400 006.
Phone: 8123636 - 8128608 - 8117511 - 8113334

NOW AVAILABLE REGULARLY AT MOST COMPETITIVE RATES:

STARCH POTATO I.P.
STARCH SOLUBLE G.R./L.R.
STARCH SOLUBLE Bacto Grade
STEARYL POTATO STARCH
SODIUM STARCH GLYCOLATE USP
FROM MAIZE/POTATO STARCH

CHOLINE DIHYDROGEN
CITRATE
PURE & 50%/70% SOLN.
CHOLINE BITARTRATE PURE
CHOLINE SALICYLATE PURE
TRICHOLINE CITRATE Min 65%

We also offer
(a) BARIUM CARBONATE (b) BARIUM CHLORIDE
(c) BARIUM SULPHATE POWDER I.P.
(d) BARIUM SULPHATE SUSPENSION 95% W/V B.P.
(e) BARIUM SULPHATE SUSPENSION 120% W/V B.P. (SWALLOW)

Contact Manufacturers

**NATIONAL DRUGS AND CHEMICALS**

75, Jawahar Nagar, Goregaon West, Bombay 400 062.
Pnone: 6723224

FOR YOUR REQUIREMENTS OF:

**INDOLE**
**ANETHOLE (99.9%)**
**MUSK XYLOL**
**(Powder & Crystal)**
**MUSK KETONE**
**PHENYL ACETIC ACID**
**ROSE CRYSTALS**
**LINALOL**

Please Contact:

**D.D. SHAH &CO.**

DAMODAR BUILDING, 105, PRINCESS STREET, BOMBAY 400 002.
TEL. NOS.: 31 20 55 / 29 35 54 / 29 05 74
TLX. NO.: 011-5732 DDS IN CABLE: FORENOON BOMBAY 400 002.

**The Planet Earth is the greatest chemist we know.**

What fecund and creative chemistry.
Every human, plant, animal, rock, gas or liquid
on earth has a simple or complex chemistry
behind it. The idea of so much thought and
unconscious formulation seems mind-boggling,
but Nature does it regularly and effortlessly.
It inspires us.

Process chemicals for the textile industry for Sizing, Desizing,
Mercerising, Scouring, Dyeing, Printing and Finishing.

SUPERTEX®

**SUPERTEX®**
(INDIA) CORPORATION
132, Dr. Annie Besant Road, Bombay-400 018
Phone: 493 6041, 493 38 18, 493 5482.
Grams: 'Thinogum'. Telex: 75643.

a M.G. Saraf Enterprise
Most trusted name in chemicals.

For most competitive quotation, best quality, prompt delivery of

**CLOVE OIL** (Pharma Grade)
**CINNAMON OIL** (Pharma Grade)
**ANETHI OIL** (Pharma Grade)
**CASSIA OIL** (Pharma Grade)
**AJOWAN OIL** (Pharma Grade)
**ORANGE OIL** (Pharma Grade)
**CINNAMON LEAF OIL** (Pharma Grade)
**ALMOND OIL** (Pharma Grade)
**LEMON OIL** (Pharma Grade)

Please Contact Manufacturers:

**CHEMICAL PROCESS CONSULTANTS**

Unit 202, Adarsh Ind. Estate, Sahar Road, Chakala, Andheri (East), BOMBAY 400 099.
Tel: 6325855
Gram: KEMIPROSS

**FILTERCLOTH! FILTERCLOTH!**

India,s Multinational National and Leading Manufacturers Prefer Filter Cloth From:-

**POPAT BROTHERS**

For CHEMICALS, CEMENT, CERAMIC, DYES, OIL, RUBBER, PAPER, SUGAR, and other Industries in Cotton, Synthetic, Nylon, Polyester (Terylene) Polypropylene, and others,

We also offer Centrifuge/Nutch Bags, Filter press Pieces as per your requirement

For detailed Information write to:

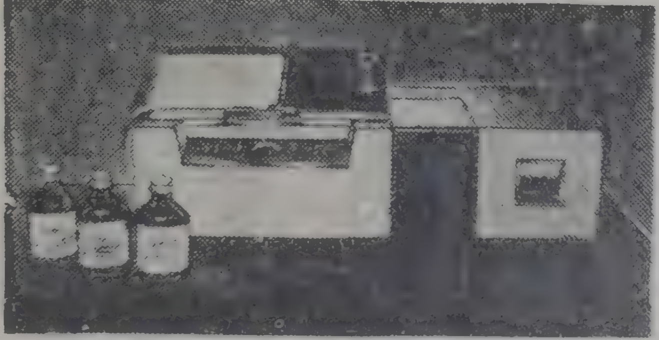
**POPAT BROTHERS**

249, YUSUF MEHERALI ROAD, P.B. BOX NO. 13074
OLD MASJID BUNDER ROAD, BOMBAY: 400 003 (INDIA)
TELEX: NO. 011-75622 DHCO IN
GRAM: POPBROS
TEL: 327101 / 343957

PRINT-DESIGN 422 3615

The lowest %, the highest marks !

**Lowest % absorption gives RANBAXY'S Solvents for Spectroscopy highest marks for accuracy!**



Ranbaxy's solvents for spectroscopy give minimum absorbance at specified wavelengths leading to optimum accuracy. Currently available is the following range of solvents:

- ACETONE
- BENZENE
- CARBON TETRACHLORIDE
- CHLOROFORM
- DICHLOROMETHANE
- ETHYL ACETATE
- METHANOL
- iso-PROPANOI

*For your requirements, please contact :*

RANBAXY
LABORATORIES LIMITED

CHEMICAL DIVISION MARKETING OFFICE
16, MARINA ARCADE, CONNAUGHT CIRCUS
NEW DELHI 110 001
Phones : 323738, 323739; Telex : 031 4220
Cable : RANBAXYLAB CONNAUGHT CIRCUS

Put **RANBAXY** Reliability in your Laboratory!

We offer following Speciality Chemicals
from ready stocks

We offer following speciality
chemicals from incoming
consignment

WITH MODVAT BENEFIT

. CARBOPOL 934 & 940 N.F.
(B.F. Goodrich USA)

2. H.P.M.C. 2910 USP/PREMIUM
Methocel E 5, E 15, K 100, E4M
Methocel E 6/Pharmacoat 606
3. EUDRAGIT (Rohm Pharma GmbH)
L 100, Rs PM, L 30 D, E 30 D
4. MICROCRYSTALLINE CELLULOSE N.F.
Avicel PH 101 & PH 102 (FMC USA)

5. SODIUM STARCH GLYCOLATE USP
Promojel USP (AVEBE Holland)

6. XANTHAN GUM N.F.

7. HYDROXY ETHYL CELLULOSE
Natrosol 250 LR/250 GR
8. ETHYL CELLULOSE N.F./USP
N-10, N-20, N-50

1. H.P.M.C. 2910 USP/PREMIUM
Methocel E 15 LV / E 50 LV
Methocel K4M/E4M/F4M
2. VEEGUM N.F., HV, K, F
(Vanderbilt Trade USA)

3. H.P.M.C. Phthalate USP
(Shin Etsu Japan)
4. EUDRAGIT L 100, RL 100
5. AVICEL PH 102 N.F./USP
(FMC Corpn. USA)

Please Contact for your specific requirements
Mr. VIJAY DOSHI

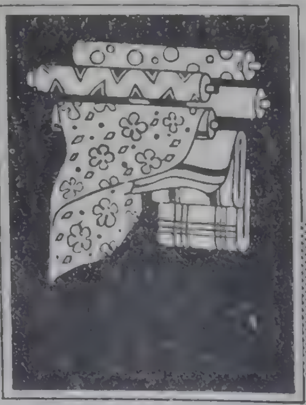
M/s. PIOMA CHEMICALS

11, Bombay Talkies Road, Malad (West), Bombay 400 064.
Tel.: 682 0626 Telex: 011 70076 PCO X IN Fax: 682 2757 ATTN: VIJAY DOSHI, PIOMA

PCI
SILICONES

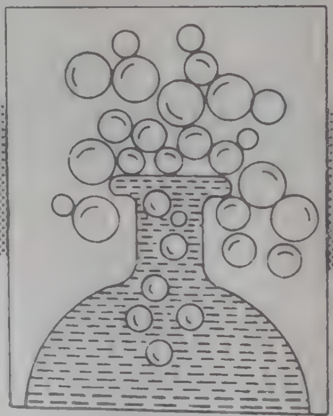
ATTENTION!
Actual Users/Dealers/Stockists Reduce Your Cost By Using Our Products

PREMOULD-600
SILICONE MOULD RELEASE AGENT
FOR RUBBER INDUSTRIES.



PRESIL-300
SILICONE EMULSION FOR
TEXTILE INDUSTRIES.

& AMINO SILICONES



MULTI
FOAMER N.P. J.
SILICONE DEFOAMER/
ANTI FOAM EMULSION

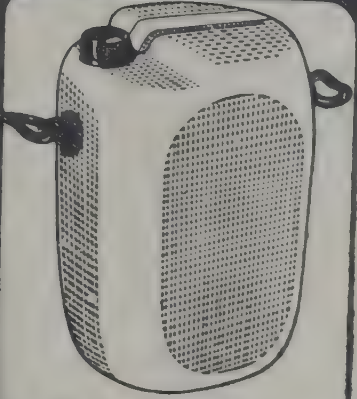
Please Contact
PREMIER CHEMICAL INDUSTRIES
Shah & Nahar Industrial Estate, A-1, Gala No. 109, 1st Floor, Near Sun Mill Compound, Lower Parel (W), Bombay - 400 013.
PHONE : 4949771 — 4942176 — 4945869
Branch: 538, Jash Market, Ring Rd., SURAT-395 002. PHONE:40136

H.D.P. WHITE & BLACK

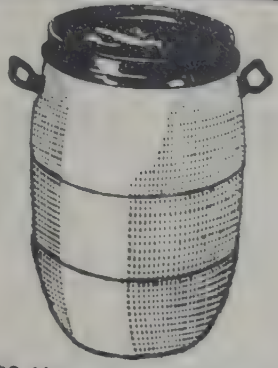
JERRY CANS, CARBOYS & JARS

from PIL'S Virgin material

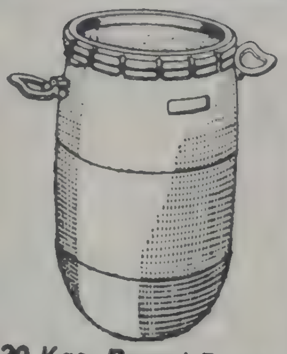
manufactured on IMPORTED Machines



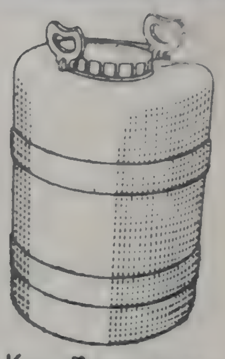
50 Ltrs. Jerry Can



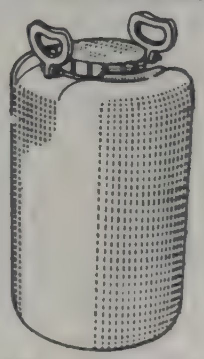
50 Kgs. Round Drum
Full Top Open — 12" Cap



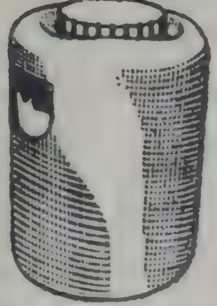
30 Kgs. Round Drum
Full Top Open — 10" Cap



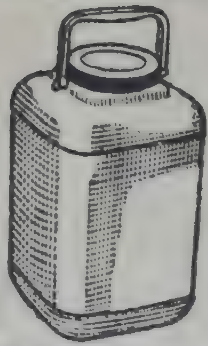
50 Kgs. Round Drum
— 6" Cap



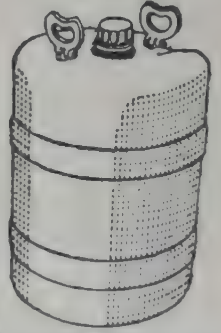
30 Kgs. Round Jar
— 6" Cap



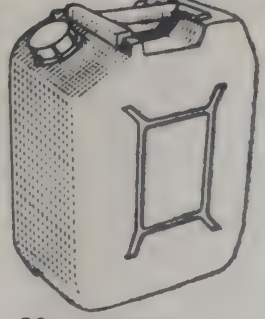
20 Kgs. Round Jar
— 6" Cap



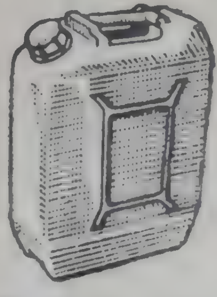
6 Kgs. Square Jar
— 4" Cap



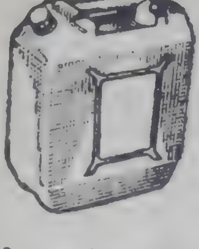
50 Kgs. Round Drum
— 2" Cap



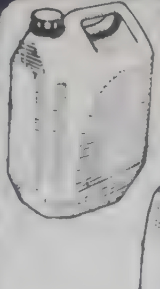
30 Ltrs. Jerry Can
Stackable



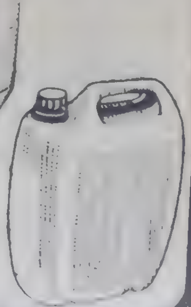
20 Ltrs. Jerry Can
Stackable



10 Ltrs. Jerry Can
Stackable



5 Ltrs.
Jerry Can



6 Ltrs.
Jerry Can

**Rajdeep Plastics**

FOR YOUR REQUIREMENTS KINDLY CONTACT
17, JAMNADAS INDUSTRIAL ESTATE,
OPP. JAWAHAR TALKIES, DR. R.P. ROAD,
MULUND (W), BOMBAY 400 080.
PHONES: 5613344 ■ 5616688

ALUMINIUM CHLORIDE ANHYDROUS

NO WAITING -- ASSURED BEST QUALITY -- PROMPT DELIVERIES
NO WAITING PERIOD -- ANY QUANTITY -- AVAILABLE
FOR LONG TERM CONTRACT

CONTACT LARGEST MANUFACTURERS:

**ARONI CHEMICALS**

(PROP. ARONI COMMERCIAL COMPANY LTD.)

REGD. OFFICE

29, Bank Street, 1st Floor
Fort, Bombay - 400 023
**Phone: 2862453/2863021**
**Gram: METALDIST**
**Tlx: 011-6554 MINA IN**

HYDERABAD OFFICE

C/o. I.S.C. Associates
4-3-82, 1st Floor, Hill St.,
Ghasmandi,
**Secunderabad-500 003.**
**Phone: 70602/825429**

WORKS

Birlagram
Nagda (M.P.)
PIN. 456 331
**Phone: 104/283**
**Gram: NIYATI**

ETHANOLAMINES

(Pioneer Manufacturers in India)

MONO-ETHANOLAMINE
DI-ETHANOLAMINE
TRI-ETHANOLAMINE

TRI-ETHANOLAMINE LAURYL SULPHATE
COCO-MONO-ETHANOLAMIDE
COCO-DI-ETHANOLAMIDE
DI-ETHYLENE GLYCOL (DEG)

**P.K. VELU & CO. (PTE) LTD.**

111. Mahatma Gandhi Road, Bombay 400 001.
Tel. 274123 / 5557161 * Telex: 11-82528 VELU IN

If the history of planet Earth can be seen as 1 day, then,

1) The Human species arrived only 10 minutes ago.
2) Civilization is only 5 seconds old.
3) The Industrial Revolution only 1/8th of a second.
Yet so much has been achieved in 1/8th of a second.

Superchem making the most of 1/7th of 1/8th since we arrived 'only' 30 + years ago;

Process chemicals for the textile industry for Sizing, Desizing, Scouring, Mercerising, Dyeing, Printing and Finishing.

SUPERCHEM

SUPERCHEM
132, Dr. Annie Besant Road, Bombay-400 018
Phone: 493 6041, 493 38 18, 493 5482.
Grams: 'Thinogum'. Telex: 75643.

a M.G. Saraf Enterprise
Most trusted name in chemicals.

We Offer Best Quality at Competitive Rates:

- ZINC DUST (100, 200 & 300 Mesh)
- ZINC CHLORIDE (Solid & Powder)
- ZINC OXIDE (Oil Grade)
- ZINC CARBONATE
- ZINC HYDROXIDE
- ZINC ASH
- BRASS ASH
- ZINC SULPHATE (Tech. & Monohydrate)

Please Contact:
Mr. [illegible] M. Shah [illegible]

**SACHIN CHEMICAL CORPORATION**

[illegible] Chambers, 7-A, [illegible] Street, 1st Floor, Bombay 400 003
Phones: Office: [illegible] Resi.: [illegible] Gram: "[illegible]"

---

Ethylene Dichloride 250 Kg. HDPE Drum Packing · Formaldehyde 220 Kg. HDPE Drum Pack

TRIETHANOLAMINE DIETHANOLAMINE MONOETHANOLAMINE

ETHER PETROLEUM [illegible] OLEIC ACID TECH

AMYL ACETATE
BUTYL CELLOSOLVE ACETATE
BUTYL CARBITOL ACETATE
CELLOSOLVE ACETATE
MONOCHLORO BENZENE
TRICHLORO BENZENE
PARA DICHLORO BENZENE

CARBITOL ACETATE
ISOPROPYL ACETATE
METHYL ACETATE
OCTYL ACETATE
ORTHO DICHLORO BENZENE
ISO AMYL ALCOHOL

TRIETHYLAMINE
DIETHYLAMINE
MONOETHYLAMINE
MONOISOPROPYLAMINE
DIISOPROPYLAMINE
MONOCYCLOHEXYLAMINE
DICYCLOHEXYLAMINE

For INK / VARNISH / PAINTS Mfrs.
MALEIC RESIN (Spirit Soluble / Oil Soluble)
POLY VINYL BUTYRAL (P.V.B.)

**Chemical Solvent Centre**

[illegible] Princess Street, [illegible] Mansion, 1st Floor, Bombay 400 002
Office: [illegible] Resi: [illegible]
Gram: CHEMSOLVFICE * Telex: [illegible]

---

Available At Very Competitive Rates

**BUTYL ACRYLATE MONOME**

[illegible]

**SULAKI CHEMICALS PVT. LTD.**

[illegible]
[illegible]
Phone No. [illegible]
[illegible]
[illegible]
Phone No. [illegible]

FOR YOUR REQUIREMENTS

OF

## APISOLVE - 118

(ETHYLENE GLYCOL MONO BUTYL ETHER)

## APITOL - 162

(DIETHYLENE GLYCOL MONO BUTYL ETHER)

MANUFACTURED BY

## ADVANCE PETROCHEMICALS LIMITED

93, NEW CLOTH MARKET, AHMEDABAD : 380 002 (INDIA)
TEL: 360273/360344/391295

**ALSO INTRODUCING ETHYL/METHYL GRADES OF GLYCOL & DIGLYCOL**

CONTACT

AUTHORISED DISTRIBUTORS

INDOKEM

## INDOKEM LIMITED

UDYOG MANDIR COMPOUND, 7 C, BHAGOJI KEER MARG, MAHIM,
BOMBAY : 400 016

TEL: 462745/462842/462721/452029

### BRANCHES

| AHMEDABAD | DELHI | CALCUTTA | KANPUR | MADRAS | NAGPUR | SECUNDERABAD |
|---|---|---|---|---|---|---|
| 22136 | 3274083 | 277400 | 52628 | 31756 | [illegible] | 843995 |
| 22137 | 3279379 | 274820 | 53239 | 30423 | 45719 | [illegible] |

Regularly Available at Most Competitive Price:

**SACCHARINE PLAIN/SODIUM-I.P.**

**PARA TOLUENE SULPHONAMIDE**
**PARA TOLUENE SULPHONYL CHLORIDE**
**ORTHO TOLUENE SULPHONAMIDE**

Contact Manufacturers:

**SWEETEX CHEMICAL INDUSTRIES**

19, Kapadia Chambers. 51, Devji Ratanshi Marg. Bombay 400 009.
**Phones: 869871/861835/8518333**

---

ESTABLISHED 1968

NO COMPROMISE ON QUALITY WITH
**BHAVNA'S**

**SILICAGEL**
(Indicating & Non-indicating Type)
Column Chromatography
Thin LAYER Chromatography

MANUFACTURED BY

**Bhavna Chemical Industries**

51, Vithal Udyog Nagar, Vallabhvidhyanagar, Gujarat 388 121.
Tel. No. Fact: 30243 Resi: 30712 Bombay Contact Tel No: 507507
VALLABHVIDHYANAGAR STD CODE NO.: 02692

ADVT/4

---

EXCEL

AVAILABLE EX-STOCK

**DIETHYL OXALATE**
**OXALIC ACID**

PCPL

- Phosphoric Acid
- Phosphorous Acid
- Vanadium Pentoxide
- Sodium Nitrite
- Thionyl Chloride

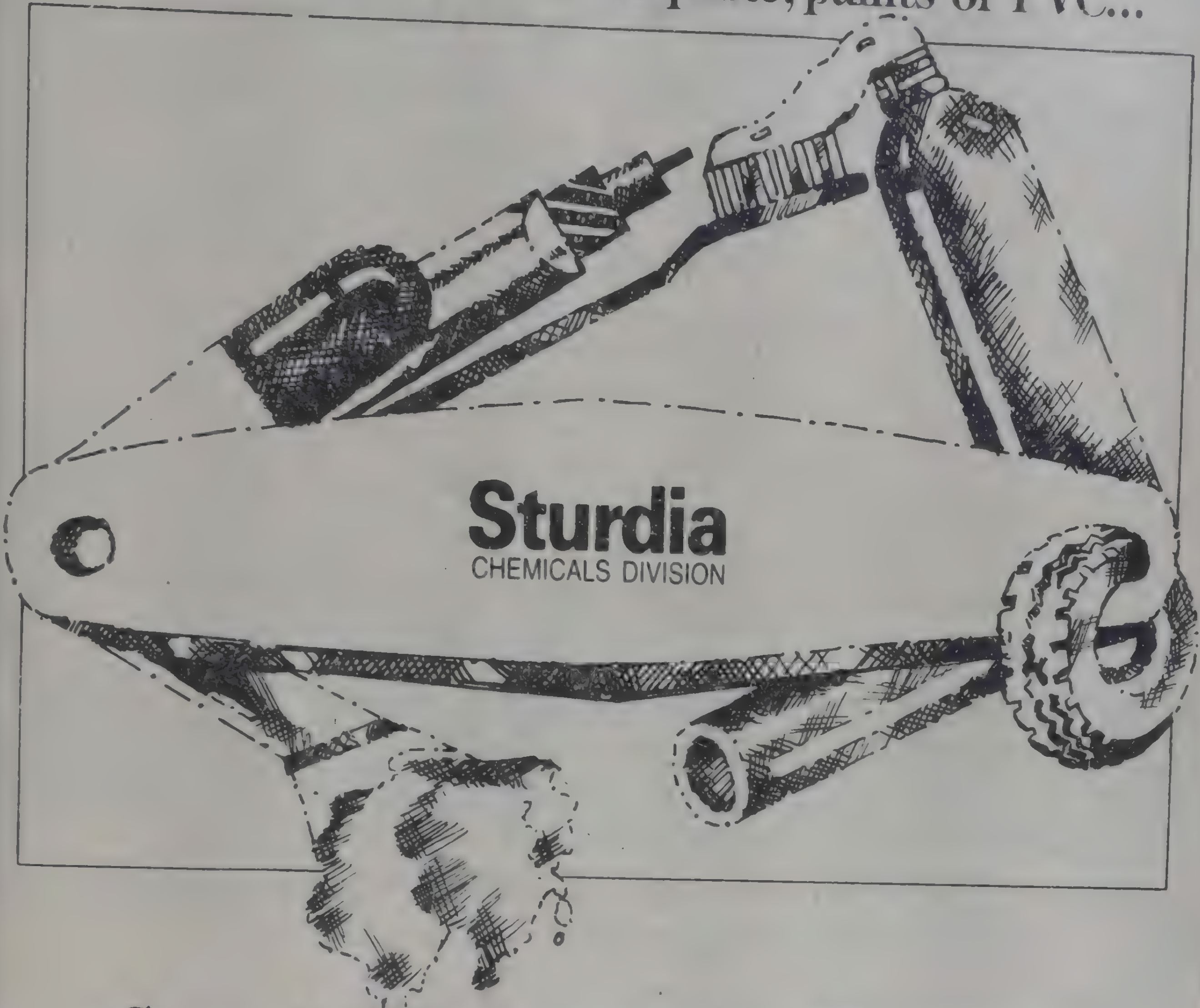
- Phosphorous White/Red
- Ammonium Metavanadate
- Phosphorous Pentoxide
  - Trichloride/Oxychloride

Please Contact:

**ALKA SALES CORPORATION**

Nanabhai Mansion, Sir P.M. Road. Fort, Bombay 400 001
Tel.: 2864773-2850661-2860390 Grams: BRAJI Telex: 83158 DOSA-IN

Whether it's tyres or toothpaste, paints or PVC...



Sturdia Calcium Carbonate
Quality is our cutting edge

Leading names in the industry will testify to the quality of Sturdia Calcium Carbonate.

As India's largest manufacturer, Sturdia meets the needs of industries ranging from cables, tyres, PVC pipes, rubber goods and paints to toothpaste, drugs, cosmetics and printing inks. The list continues to grow.

**Sturdia has now introduced a new grade-Forcal 'C'** which is being extensively used in the manufacture of rigid PVC pipes

**Sturdia**
CHEMICALS DIVISION

CITURGIA BIOCHEMICALS
LIMITED
Regd. Off: Neville House, J.N. Heredia Marg,
Ballard Estate, Bombay 400 038 Tel 2618071
Gms: CITURGIA, BOMBAY

Tlx : 11-73372 BDM IN

Seasons A A/CB/286 R

FOR YOUR REGULAR REQUIREMENTS AT COMPETITIVE RATE

**SODIUM CHLORITE**

**80% & 50% Also Liquid 25% Packing - 50 Kgs.**

**3,4 D.A.B.P.**

**Manufactured By: M/s. Sumanth Fine Chemicals 6 KIADB, Loki Pvt. Ltd.**
**Kere Road, Dhavangiri, Pin. 577 005.**

Please Contact:

**MEHTA BROTHERS**
160/162, Samuel Street, 1st Floor, Masjid Bunder, Bombay 400 009.
**Phone: 8558881 Resi.: 6140649**

For Your Requirements of:

1. **Manganese Sulphate Monohydrate**
   Technical, Feed and Fertilizer Grade
2. **Manganese Carbonate**
3. **Zinc Sulphate**
   Fertiliser, Feed Grade

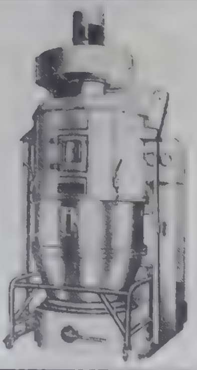
Please Contact Manufacturers:

**LAKSHMAN CHEMICALS (DAVANGERE) PRIVATE LIMITED**
Post Box No. 233, DAVANGERE - 577 002.
**Phone No. Off. 3080; Fact. 3359; Resi: 6359.**

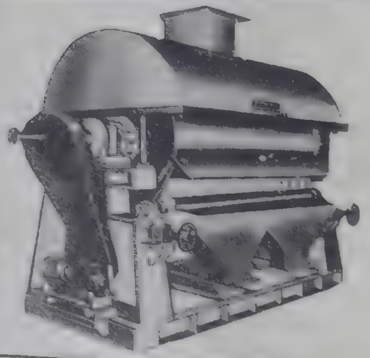
**PRAGATI** *the name of quality products.*

CENTRIFUGES

FLUID BED DRYER



CHEMICAL FLAKER



Manufactured by
**PRAGATI ENGINEERING WORKS.** Plot No. N-8, Shed No. W-88 (A),
Chikhaloli, MIDC, AMBARNATH-421 501 PHONE: 2961.

Connected to one of the oldest industries in the world, which incidentally is also the youngest.

From ancient garments made of bark and hide, through historical finds of Chinese silk and Egyptian cotton at burial sites, to modern fabrics made on computerized looms, humankind's relations with clothes are as old as civilization. From the time when lamp-black, powdered lapis lazuli, red ochre, dye secretions of the banded murex snail, indigo and other plant, mineral and animal dyes have been used, human facination with colouring agents is also well known.
We at Texchem continue this oddyssey, this quest for cloth and its colour.

Process chemicals for the textile industry for Sizing, Desizing, Scouring, Mercerising, Dyeing, Printing and Finishing.

TEXCHEM®

TEXCHEM®

132, Dr. Annie Besant Road, Bombay-400 018
Phone: 493 6041, 493 38 18, 493 5482.
Grams: 'Thinogum'. Telex: 75643.

a M.G. Saraf Enterprise
Most trusted name in chemicals.

ENQUIRY SOLICITED FROM ACTUAL USERS IN TANKER LOAD ONLY
FOR FOLLOWING QUALITY PRODUCTS ON LONG TERM AND REGULAR BASIS

**SULPHURIC ACID 98%** COMM. GRADE

**SULPHURIC ACID** BATTERY GRADE (CONCENTRATED)

Contact:

**TARAPUR ACID & ALKALI PVT. LTD.**

*OFFICE:*
15, Amrit Keshav Nayak Marg, 3rd Floor
Near New Empire Cinema
Fort, Bombay 400 001
Tel. No.: 2046979/2040266/2048850/2044228
Gram: 'YELLOWGOLD
Telex: 011-84569 GOLD IN

*FACTORY*
Post Box No. 2, Plot No. D 22
Tarapur Industrial Area, M I D C
Boisar, Dist. Thane 401 506
Tel. No.: 2550/2551/2553
Cables: 'CHEMICALS' Boisar
Telex: 0132-215 ACID IN

**WE MANUFACTURE AS PER SPECIFICATION**

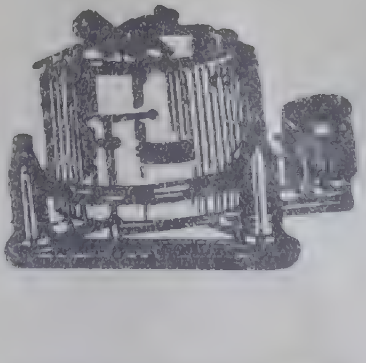
(1) SODIUM SILICATE ALKALINE & NEUTRAL LIQUID AND LUMP ALSO IRON FREE
(2) POTASSIUM SILICATE
(3) SODIUM META SILICATE $9H_2O$ & $5H_2O$

**SAPANA CHEMICAL INDUSTRIES**

19, BARODA CO-OPERATIVE INDUSTRIAL ESTATE,
CHHANI ROAD, BARODA- 390 002
PHONES : (F) 21950 (R) 21911

**CENTRIFUGES (Hydro-Extractor)**

30 cm to 150 cm dia basket size in MS/SS/SS Lined/RL/RRP Lined



We also Fabricate
REACTION VESSELS, PRESSURE VESSELS, CONDENSORS, STORAGE TANKS, BALL MILLS & MS/SS FABRICATION.

CONTACT MANUFACTURERS:

**CHEMO FAB INDUSTRIES**

Ram Baug, Behind State Bank of India, S.V. Road,
Chincholi, Malad (West), Bombay-400 064.
Phones: Factory: 6821401/6821695 Resi.: 6821894

Agent for Andhra Pradesh -- Mr. M.N. Rao, M/s. Anirudh Agencies,
B-104, Badruka Enclave, Road No. 12, Banjara Hills, Hyderabad-500 034.

**CHANGE OF ADDRESS:**

**SUNIL CHEMICAL INDUSTRIES**

Authorised Distributors:

**RAMA PETROCHEMICAL LTD.**

**OSWAL PETROCHEMICALS LTD.**

**OUR NEW ADDRESS IS:**
Opp. B.M.P. Equipment, (16-B),
Netaji Palkar Road, (Old N.S.S. Road),
Narayan Nagar, Ghatkopar (West),
Bombay 400 086.

**Phones: 5112459, 5112460, 5146980, 5146981, 5146982, 5146983, 5147885**
**Residence: 5126597, 5127649, 4121896, 4121915, 6441713, 6441821**

---

Contact:

**Area Distributors:**
**H.P. LUBRICANTS**
**Authorised Distributors:**
**HINDUSTAN PETROLEUM CORPORATION LTD.**

For your small & bulk requirements of:

**Mineral Turpentine (Solvent 2445)**
**Food Grade Hexene**
**Solvent 1425 (S.B.P.)**
**Lube & Industrial Oils**

Contact:
21, Creative Industrial Estate, N.M. Joshi Marg, Near Chinchpokli Station,
Bombay 400 011.

**Phone: 378833, 891717, 396868, 394040**

**MANUFACTURERS OF**

**SODIUM NAPHTHIONATE**

**ARUN CHEMI-DYES**

**Regd. Office:** Chemical Development Compound,
Manpada, Ghodbunder Road, Thane 400 607.
**Phone: 502220/502726**
**Telex: 1172335 ARUN IN**
**Fax: 91-22-595224, 91-22-5115904**

---

**NOBLE** ***Packo-Chems***

SOLVENT OUR BUSINESS

**HEAD OFFICE:**
**17, Venkataroyen Lane,**
**P.B. No. 2315,**
**MADRAS 600 003.**
**Phones: 585840/586553**
**Grams: 'PACKOKEMS'**

**WORKS:**
**Madhavaram,**
**MADRAS-600 060.**

**ACETONE, ACETIC ACID, BENZENE, BUTANOL, BUTYL ACETATE, BENZYL ALCOHOL, BENZYL ACETATE, CARBITOL, CELLOSOLVE, CHLOROFORM, C.T.C., CYCLO HEXANONE, DIACETONE, D.B.P., D.E.P., D.O.P., D.M.P., D.E.G., ETHYL ACETATE, ETHER PET., FORMALDEHYDE, ISO-PROPANOL (I.P.A.), M.E.K., M.I.B.K., M.E.G., PROPYLENE GLYCOL, TOLUENE, TRICHLORO-ETHYLENE Etc.**

**For all your requirements in any packing**
**contact the PREMIER HOUSE OF SOLVENTS**

---

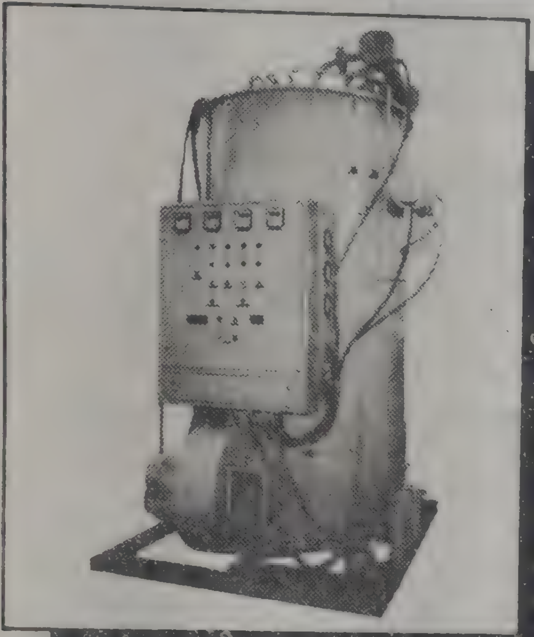
MANGANESE SULPHATE -- 98%
MONO HYDRATE
($MnSO_4$, $H_2O$) -- Mn 32%

MANUFACTURERS

**KUM INDUSTRIES**

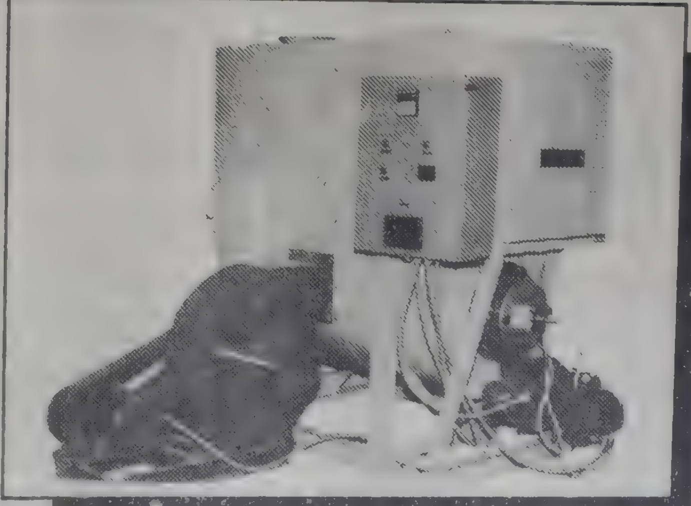
1009/2, VINOD BUILDING,
DEEP BUNGALOW CHOWK, PUNE 411 016.
PHONE: OFFICE: 53129 FACTORY: 84874

# SLASH DOWN YOUR DRYING COST



## THREE PASS OIL/GAS FIRED AUTOMATIC THERMIC FLUID HEATER

- * RANGE 50,000 TO 10,00,000 Kcal/hr
- * MAX. SUPPLY TEMPERATURE - 300°C
- * COIL FROM SEAMLESS PIPE
- * AUTO/MANUAL OPERATION
- * INDEPENDENT DRIVE FOR FUEL OIL PUMP
- * THERMAL EFFICIENCY 87 ± 2% ON NCV
- * NO CORROSSION OR SCALE FORMATION
- * EASY AND ECONOMICAL OPERATION
- * OUTSIDE PURVIEW OF IBR



## THREE PASS OIL/GAS FIRED INDIRECT AIR HEATER

- *RANGE 60,000 to 6,00,000 Kcal/hr
- *MAX. TEMP : 250°C FOR STANDARD MODEL AND HIGHER TEMPERATURE RANGE WITH SPECIAL CONSTRUCTION.
- *FULLY AUTOMATIC OIL/GAS FIRED HIGH EFFICIENCY BURNER.

For Further details :

**AEROMATIC**
**ENGINEERING COMPANY**
Near Gujarat Bottling. Rakhial, Ahmedabad - 380 023
Phone : 364669
Telex : 0121-6291 AERO IN

**OUR OTHER PRODUCTS**

- PACKAGE STEAM BOILER
- INDUSTRIAL CENTRIFUGAL FANS
- WATER RING VACUUM PUMPS.

Available Regularly at Competitive Rates Ex-Stock/Ex-Factory

**SODIUM NITRITE * SODIUM NITRATE**

Mfrd. by: M/s. SONIL Div. of M/s. CHEMCROWN (INDIA) LTD.

**RIFAMPICIN I.P. (COMPACTED)**
**IBUPROFEN I.P.**
**PHENOBARBITONE I.P.**
**2-AMINO-4-CHLORO PHENOL**
**OCTYL ACETATE**

Mfrd. by: M/s. CUREKRAFT CHEMICALS (I) PVT. LTD. Divn. of M/s. CHEMCROWN (I) LTD.

**PARA TERTIARY BUTYL PHENOL -- PTBP**
**DITERTIARY BUTYL PARA CRESOL -- DBPC (BHT)**

Indenting Agent of M/s. Balmer Lawrie & Co.

Please Contact:

**CHEMCROWN INDIA LTD.**
D/3, Poonam Apartments, Dr. A.B. Road, Worli, Bombay 400 018.
Phone: 4928386/4928737 * Telex: 011-71758 CHEM IN
CALCUTTA OFFICE: 295652/290218 * DELHI OFFICE: 3317051/3316666 * KANPUR OFFICE: 211641/211825 * MIRZAPUR OFFICE: 3580

AVAILABLE REGULARLY

**ALUMINIUM STEARATE * ZINC STEARATE * LEAD STEARATE**
**T.B.L.S. D.B.L.S.**

C.P.W., D.O.P., TOLUENE, ORTHOXYLENE, MEK, PROPYLENE GLYCOL/DOW/ARCO/JAPAN, I.P.A., MIX. XYLENE, ACETONE, GILSONITE, P.G. RED OXIDE, SOYALECITHIN, CARBON BLACK, DEG REFILE, 2B WHITENER, COTTON, SYNTHETIC PLASTIC WHITENER FOR LD/HD/PP/PVC/ACRYLICS. VERGINE, TITANIUM DIOXIDE, PHOSPHORIC ACID 85%, JSR RUBBER, KEMLOP, A. WAX, 4202 JAPAN, E 114, STEARIC ACID.

Contact:

**UNIQUE ENTERPRISES**
503, Bharuch Sadan, Iron Market, Devji Ratanshi Marg, Bombay 400 009.
Telephone: Office: 331475/344445 Residence: 6062955

REGULAR REQUIREMENT COPPER WASTE IN ANY FORM OXIDE/DUST/ASH. WE REQUIRE CHEMIST IN RUBBER ADHESIVE

**CREAM OF TARTAR LR/AR**
(Potassium Bi-Tartarate)
**ANTIMONY POTASSIUM TARTARATE LR/AR**
**ROCHALLE SALT**
(Potassium Sodium Tartarate)
**SODIUM TARTARATE LR/AR**
**TARTARIC ACID (99 & 99.5%)**

Please Contact:

**NATIONAL CHEMICAL INDUSTRIES**
*Factory:* Plot No. W-43, M.I.D.C. Industrial Estate, Morivli, Ambernath, Maharashtra 421 501
*Office:* 12, Bharat Mahal, 3rd Floor, Thane (East), Maharashtra 400 603. Phone: 507267/594898

QUALITY LABORATORIES SCIENTIFIC INSTRUMENTS

Autoclaves
Baths (Water, Oil, Viscosity, Low Temp.)
Colorimeters
Furnaces
Incubators
(Bacteriological, B.O.D.)
Micro-Litre Syringes (for G.C. & H.P.L.C.)
Ovens
Petroleum Testing Instruments
Pumps, Vacuum
Stirrers (Overhead, Magnetic)

Thermometers (Stem type, inclusion, as per IP and ASTM)

Water Stills
Balances (Two-pan, Single-pan)
Centrifuges (all types)
Conductivity meters
Hot Plates & Heating Mantles
Karl Fischer Titrators
Microscopes (Mono, Bino, Stereo & Research)

pH Meters
Polarimeters
Refractometers (Abbes)
Tapes (Heating)

Viscometers

**C. ABHAYKUMAR & CO.**

Gopal Nivas, 127, S. Gandhi Marg, Bombay 400 002.
Grams: 'JITMARA' Telephone: 316397/295184

---

| | |
|---|---|
| PETROLEUM ETHER 40°-60°* | German |
| POTASSIUM CARBONATE* | France |
| EPICHLOROHYDRINE* | Japan |
| DIMETHYL ACETAMIDE* | USA |
| PIVALOYL CHLORIDE* | France |
| 2 ETHYL HEXANOIC ACID* (OCTOIC ACID) | Japan |
| PYRIDINE 2° | Belgium |
| METHYLENE CHLORIDE | Holland/ ICI make |
| ISOPROPYL ALCOHOL (IPA) | — |
| DIMETHYL FORMAMIDE* (D.M.F.) | Japan |

* (With MODVAT Benefits)

Kindly forward trade inquiries

**HASMUKHRAY & CO.**

198, Mangaldas Building No. 3B, Mangaldas Road, Bombay 400 002.
Tel. Nos.: 31-7815/29-2386/25-1744 Cable: JAYJANAK Telex: 11-82192 JAY IN
Hyderabad Telephone Nos.: 840408/840356

FOR YOUR REQUIREMENTS OF

**HYFLOSUPERCELL - U.S.A.**
**THIOUREA**
**DICYANDIAMIDE (D.C.D.A.)**
**DIMETHYLAMINE (RCF)**
**TARTARIC ACID**

Please Contact

**JAYDIP AGENCIES**

2-B, Ganga Vihaar, 94, Kazi Sayed Street, Bombay 400 003.
Phones: Office: 343316/331357 1.00 to 7.30 P.M. Resi.: 6366280 8.00 A.M. to 12.00 Noo
Fax: 00-91-22-325620 (JA) Gram: "JAYDIPIMPO" Bombay 56

Available from Ready Stock

**Hydrofluoric Acid 40-50-60%**

*Distributor of*

M/s. GUJARAT FLUOROCHEMICALS LTD.

Contact:

**M/s. UNION ACID & ALKALI P. LTD.**

151-B, Mittal Court, Nariman Point,
Bombay 400 021
Tel.: 223222/231455/244075 * Telex: 011-5290 UNIN-IN

**M.D.I.** (Diphenyl Methane Di Isocyanate PAPI-27) (DOW, U.S.A.

HYDROXY ETHYL CELLULOSE (LR/GR) * H.P.M.C. ALL GRADE
SYNTHETIC ACRYLIC RESIN 50% (I.C.I. U.K.) (For Paint or Ink)
FORMOSUL (U.K.) (Against Rangolite-DS) (Imported)
BETA NAPHTHALENE SULPHONIC ACID (BICO)
UVTEX (Optical Whitening Agent for Plastic Industries) (Imported)
PARA NITRO ACETOPHENONE * METHYL CELLULOSE ALL GRADE
EPOXY PLASTICIZER (Imported) * P.V.C. (Additives)

Please Contact:

**AMRIS CHEM**

404, Guru Krupa, 133, Kazi Sayed Street, Bombay 400 003.
Phone: Office: 335233, 341444; Resi.: 6121976, 6150823 • Telex: 011-73130 SWAMI IN

*Now Available*

**HINDUSTAN BORAX & BORIC ACID**

Tech. grade & IP in Powder, Granular & Crystal

*Manufactured by*

**Nura Pipe Industries Pvt. Ltd., Umbergaon**

Contact Authorised Distributors

**SWASTIK CHEMICAL AGENCIES**
10, N.L. Market,
153, Panjarapole Lane,
Opp. Suryanarayan Temple
BOMBAY - 400 004
**Ph: 8518368, 8553490**

**REME PRIVATE LIMITED**
72, Okhla Indl. Estate,
NEW DELHI - 110 020.
**Ph: 630866, 6830214**
**Telex: 031-61002**

*Also available*

**Nickel Sulphate, Copper Sulphate,**
**Zinc Sulphate (All grades), Ammonium Chloride (Technical),**
**Alum (Ferric & Non-Ferric)**

WANTED DISTRIBUTORS IN ALL TOWNS

Sterling

PETROLEUM BENZINE (PETROLEUM ETHER)
40°-60°/60°-80°/60°-95°/80°-100°/80°-120°/90°-100°/100°-120°
HEXANE 65°-70° EMULSIFYING WAX

* *

AROMATIC CHEMICALS

* *

AMYL BUTYRATE ETHYL BUTYRATE BUTYL BUTYRATE
ISO BUTYL BUTYRATE ISO AMYL ACETATE AMYL PROPIONATE ETHYL PROPIONATE
SCHAEFFER'S ACID (AS SODIUM SALT) (Export Enquiries Solicited)

Contact Manufacturers

**STERLING ORGO & INORGO CHEMICALS P. LTD.**

**Regd. Office:** 340/42, Samuel Street, Raut Chamber, 4th Floor, Bombay 400 003.
**Phones: 333601/333602/338722 Telex: ASIM IN 73145 Fax: 331738**
**Factory:** Plot AF-1, Cama Industrial Estate, Walbhat Road, Goregaon (East), Bombay 400 063.
**Phone: 6730458/6734593/6734650 Resi.: 352625/364354/8114061**

For Your Requirements of:

- BENZENE
- TOLUENE
- XYLENE (Ortho/Mix)
- D.E.G.
- M.E.G.
- SOLVENT CIX
- ACETONITRILE
- ACRYLONITRILE
- BUTYL ACRYLATE
- METHYL ACRYLATE
- ETHYL ACRYLATE
- STYRENE MONOMER
REACTIVE/DIRECT DYES
- BINDER (Textile/Leather)
- PIGMENT EMULSIONS
- TEXTILE OILS (Antistatic-Coning/Warping etc.)
- CATIONIC SOFTENERS
- ACRYLIC SIZE

Please write to:

**PARIMAL TEXTILE WORKS**

48, Gokhale Road (South), Dadar, Bombay 400 028.
Phone: 4225276

AVAILABLE IN BULK QUANTITY AND READY STOCKS

**POLYNOL -205**
(against Unitika UP-050-G)
For 'O' Filament Sizing Yarn
**POLYNOL - 117**
(against PVA-173 & BF-17)
**POLYNOL-217**
**POLYNOL-224**
(against GH-17 & BP-20)
**VINYL ACETATE MONOMER**
**STYRENE MONOMER**
**AUTHORISED DISTRIBUTOR FOR POLYCHEM LTD.**

CHECK OUR OFFER BEFORE YOU BUY

**MANSI POLYCHEM PVT. LTD.**

B/1 MILIND PARK,
OPP. ST. XAVIER'S HIGH SCHOOL
BUS STOP, MEMNAGAR ROAD.
AHMEDABAD-380 052. (INDIA)
PH : 485100/490084

TLX 121 6196 MPC IN
GRAM - POLYNOL

ATTENTION MANUFACTURERS OF DYESTUFFS, DYE INTERMEDIATES, BULK DRUGS AND BULK DRUG INTERMEDIATES

Regularly Available on Competitive terms

**ACETANILIDE**
**OF ULTRA PURE QUALITY**

INTRODUCING SHORTLY

ANILINE OIL
N,METHYL,N,HYDROXY ETHYL ANILINE
OXYETHYL NITRO ANILINE
N,N,DIHYDROXY ETHYL META TOLUDENE
N,ETHYL-N-HYDROXY ETHYL ANILINE
N,N,DIHYDROXY ETHYL ANILINE
N,N,DIHYDROXY ETHYL META CHLORO ANILINE

Contact Manufacturers

**VASUDHA CHEMICALS PVT. LTD.**

501, Sai Ashish A-Wing, Balrajeshwar Road, Mulund (W), Bombay 400 080.
Tel: 5604382/5613921 Fax: 91-22-5603680 Tlx: 011-71030 DELT IN

VINOSHA

FOR YOUR REQUIREMENT OF EFFICIENT HEATING AND DRYING EQUIPMENTS LIKE:-

☐ FULLY AUTOMATIC OIL FIRED NON-IBR BOILERS UPTO 500 KGS/HOUR.
☐ OIL FIRED THERMIC FLUID HEATING SYSTEMS IN ALL CAPACITIES.
☐ COAL/WOOD/HUSK FIRED THERMIC FLUID HEATING SYSTEMS.
☐ OIL FIRED TRAY DRIERS FOR 200 TO 1200 TRAYS.
☐ INDUSTRIAL DRYING OVENS IN ALL CAPACITIES HEATED BY ELECTRICITY/STEAM/THERMIC FLUID.
☐ FLUID BED DRIERS.
☐ HOT WATER GENERATORS.
☐ WASTE HEAT RECOVERY SYSTEMS.
☐ ROTOCONE VACCUM DRIER.

**M/s. VINOSHA BOILERS PVT. LTD.**

204 CHANDAN CHAMBERS, 138, MODI STREET, FORT MARKET, BOMBAY - 400 001.
TELEPHONE: 2611515/2612061 GRAMS: 'VINOSHA' TELEX: 011-76004 SAIR IN

**AVAILABLE FOR EXPORTERS AND DOMESTIC CONSUMERS**

**SODIUM BI SULPHITE** Tech/Photo/Pure
**SODIUM META BISULPHITE** Tech/Photo/Pure
**SODIUM SULPHITE** Tech/Photo/Pure
**SODIUM CARBONATE MONO HYDRATE**
Tech/Photo/Pure
**AMMONIUM THIO SULPHATE 60% SOLUTION**

Contact Manufacturer

**MEHTA SULFITES (IND) PVT. LTD.**

215/216, Swastik Chambers, Sion Trombay Road, Chembur, Bombay 400 071.
Telex: 011 72334 GROW IN Tel.: 528283/4/5 Gram: SULFINDIA, P.B. No. 17222.

FOR YOUR REQUIREMENTS OF

**HEXACHLOROETHANE**
**METHYL ANTHRANILATE**
**ISATOIC ANHYDRIDE**

Please Contact:

*Manufacturer:* **ANSHUL CHEMICALS PVT. LTD.**

Excel Estate, S.V. Road, Goregaon (W), Bombay 400 062.
**Telephone: 6724091**

FOR YOUR REGULAR REQUIREMENT OF:

ACETYL CHLORIDE
BENZOYL CHLORIDE
BENZOYL PEROXIDE
CHLOROACETYL CHLORIDE
BENZOTRICHLORIDE
BENZYL CHLORIDE
BENZOIC ACID

Please Contact Manufacturers

**Shree**
**ORGANIC CHEMICALS**

184, Samuel Street, 21 'A' Mandvi Chambers, 2nd Floor, Bombay 400 009
Phone: Off: 8555026/8557787/8555384
Phone: Plant: LOTE, 256

REASONABLE PRICES
AND EX-STOCKS

EDTA ACID 99 ± 1%

LIQUID EDTA (50 C.V. & 100 C.V.)

DTPA 99 ± 1%

DTPA SOLUTION 40%

NITRILO TRI ACETIC ACID (N.T.A.)

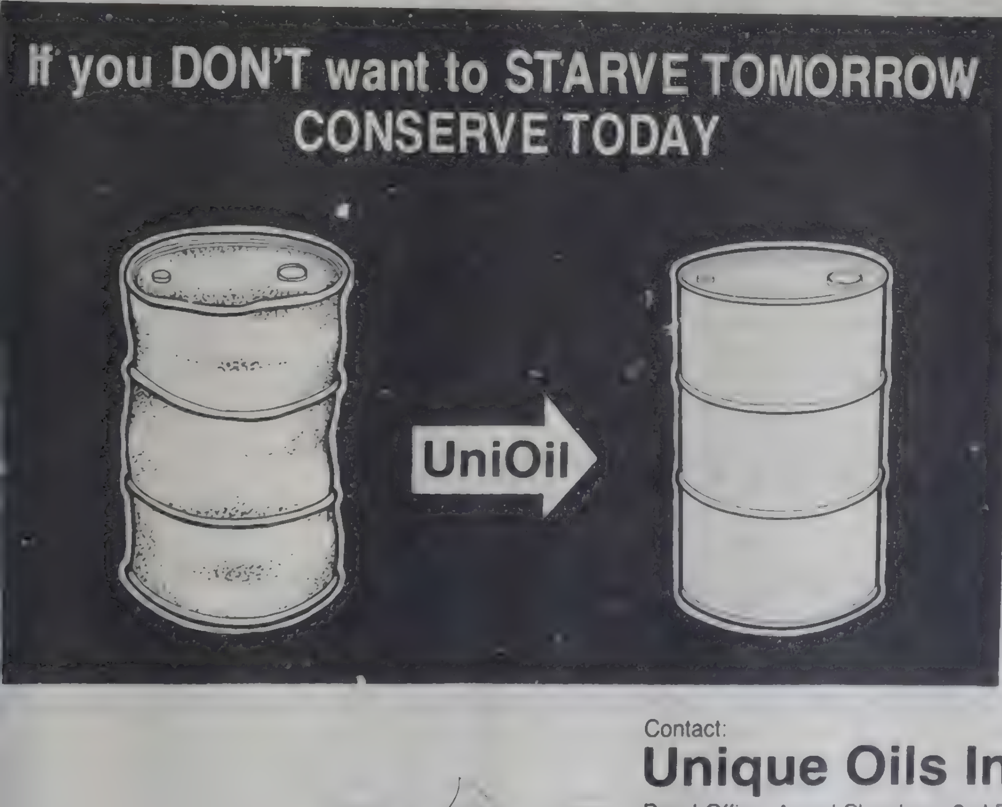
CONTACT
MANUFACTURER

**OM NEELKANTH**
**CHEMICALS INDIA PVT. LTD.**
FACTORY :
S. NO. 204, KARANNAGAR - 382 727
DIST. MEHSANA (N.G.) PHONE : 2129
(KADI - DIRECT DIAL CODE 02769)

OM NEELKANTH
CHEMICALS

OUR NEW HEAD OFFICE ADDRESS :

5, ANAND CHAMBERS, 2ND FLOOR,
NEAR STATE BANK OF INDIA, OPP. "SHILP",
NAVRANGPURA, AHMEDABAD - 380 009.
PHONE : 408360 GRAM : NEELCHEM
TELEX : 121-6539 TRCE IN
ATTN : OM NEELKANTH


If you DON'T want to STARVE TOMORROW
CONSERVE TODAY
UniOil

UNIQUE OILS INDIA LTD.
CAN SHOW YOU THE WAY

Their State-of-the-art drum reconditioning plant at Tarapur can bring back your old drums to AS NEW condition and give new lease of life to them. The process is cost-effective too. A large number of users of drums are reaping the benefits. WHY NOT YOU???

Their sophisticated used oil re-refining plant can purchase all your used lubricating oil for scientific re-refining. Give your used oil to them and prevent its use for spurious purposes Contribute towards saving country's foreign exchange

Contact:
**Unique Oils India Limited**
Regd Office: Arvind Chambers, 2nd Floor, (Gouri Studio Comp.).
194, Andheri-Kurla Road, Andheri (E), Bombay-400 069
Tel: 6347210 6320100 Telex: 011-79292 UOIL IN • Fax. 009122-636 4654

Factory: Plot M-4, MIDC Industrial Estate.
T[illegible] Dist. Thane, Maharashtra. Telex: 0132 236 UOIL IN Tel: 2893

**FOR YOUR REGULAR REQUIREMENTS OF:**

**HYDROGEN PEROXIDE 50%**

**Manufactured by: M/s. NATIONAL PEROXIDE LTD.**

Contact Authorised Stockist

**V.K. ENTERPRISE**

233/35, Samuel Street, 18, Bhatia Nivas, Vadgadi, Bombay 400 003.
**Phones: Office: 341938/348124** **Resi.: 6363983**

**We Offer Best Quality at Competitive Rates:**

**ACID SLURRY - SOFT/HARD**

MANUFACTURERS:

**Gala Chemicals**

*Admn. Office:*
C/34, Adke Compound, Surya Nagar Road, Vikhroli (W),
Bombay 400 083.
Tel. No. 583276, 587361

ATTENTION PLEASE: F.R.P. MOULDERS, FABRICATORS AND LINERS

For all your needs in

**POLYESTER RESINS**

Please Contact:

**PLIOGRIP RESINS & CHEMICALS PVT. LTD.**

One of the leading manufacturers of:

G.P. - ISO. Boat Grade, GALCOATS, Fire Retardant, Lamination & Automobile Grades

*Works:*
W/78, Phase II,
Opp. H.M.V., M.I.D.C.,
Dombivli (E), Dist. Thane,
**Phone: 5682**

*Office:*
96, Narayan Dhuru Street,
2nd Floor,
Bombay 400 003
**Phones: 333655 & 346984**

*Sales & Enquiries:*
CONTACT OFFICE
or
PHONES
Res. 6340986, 4092960, 4078280

WE TAKE EXTRA CARE
INDIAN GUM INDUSTRIES

*QUALITY * RELIABILITY * EXCELLENCE*
*Available Ex-Stock*

ADIPIC ACID
PROPYLENE GLYCOL USP (DOW)

Methylene Chloride

Tinidazole I.P.

ADIPIC ACID

REQUIRED FOR EXPORT

Norfloxacin USP Ibuprofen
Niacin BP Schaeffers Acid
Pyrantal Pamoate USP

ADIPIC ACID

Indian Gum Industries Limited
(Recognised Export House)

51-A, Maker Chamber IV, Nariman Point, Bombay 400 021.
Telex: 2139 IGUM. Tel: 243711-12-30-60

ROHAN DYES AND INTERMEDIATES
(AHMEDABAD)
FOR YOUR REQUIREMENTS AS PER INTERNATIONAL STANDARD TOP IN QUALITY

- GAMMA ACID
- G. SALT
- R. SALT
- META UREIDO ANILINE HCL
- K. ACID
- AMIDO G. SALT
- S.P.C.P.
- S.P.M.P.
- 2.5 DICHLORO S.P.M.P.
- P.M.P.
- SULFANILIC ACID (TECH. GRADE)
- SULFANILIC ACID (PURIFIED)
- SCHAFFER'S ACID
- 4-NAP
- 4-NAPSA

AND SHORTLY INTRODUCING MANY NEW ITEMS & A RANGE OF DIRECT, ACID AND REACTIVE DYES

ROHAN DYES & INTERMEDIATES

OFFICE :
189, NEW CLOTH MARKET,
AHMEDABAD-380002
PH. : 368171 & 360752, FAX : 272-346412
TELEX : 1216942 JITM IN

BOMBAY OFFICE :
2ND FLOOR, PUSHPAWATI BLDG. NO. 2
CHANDANWADI, GIRGAON ROAD
BOMBAY-400002
TEL. 256740, 298224 TLX 01182383

FACTORY :
115, GIDC, PHASE I, VATVA
AHMEDABAD-[illegible]
PH. : 831131-2, 833771 & 834469

DISTRIBUTOR :
RONAK ENTERPRISES
B/2, RAJDEEP PARK FLATS
BALIAKAKA RD., AHMEDABAD
TEL. : 296719 & [illegible]

FOR IMPORT OF
SPECIALITY ELASTOMER
PRODUCTS
(SYNTHETIC RUBBERS)
of the following ranges

**VITON®**
(Fluoroelastomer)

**VITON® FREEFLOW**

**VAMAC®**
(Ethylene/acrylic Elastomer)

**NORDEL®**
(EPDM Elastomer)

**NEOPRENE**
(Polychloroprene)

**HYPALON®**
(CSP Elastomer)

**HYTREL®**
(Engineering Thermoplastic Elastomer)

**CURATIVES & PROCESSING AIDS**

**TETRONE-A®**

**HVA-2, DIAK**

® Registered T.M. of E.I. Du pont De Nemours & Co. (INC.), USA.

Contact:

Head Office
**BHIMRAJKA IMPEX PVT. LTD.**
708, Maker Chamber V
Nariman Point, Bombay - 400 021.

Phones: 2044476/2875715 (6 lines)
Telex : 011-82222 JVSC IN
Fax : (91) 22-2048289
Cable : BHIMRAJKA - BOMBAY - 21.

Branches:

CALCUTTA
2D/2, Sukh Sagar, 2/5, Sarat Bose Road,
Calcutta - 700 020.
Phone: 444607, 748101
Telex : 021-5893 SSI-IN

MADRAS
25, Chockalingamnagar, Teynampet
Madras - 600 086.
Phone: 453554

BHIMRAJKA

Authorised distributors for India of **E.I. DU PONT DE NEMOURS & CO. (INC.) USA**

# Chemical Weekly

VOL. XXXV

AUGUST 28, 1990

NO. 51

*Publishers:*
**SEVAK PUBLICATIONS**

*Editor - Publisher*
**R. RAGHAVAN**

*Advertisement Manager*
**N.R. RAJAGOPALAN**

*Administration/Circulation*
**VIJAY RAGHAVAN**

*Editorial & Administrative Office:*
306, Shri Hanuman Industrial Estate
G.D. Ambekar Road, Wadala,
BOMBAY 400 031.
Phones: 4120743/4131198.
Telex: 011-76053 CWLY IN

*Madras Office:*
Room No. 9, Wellingdon Estate,
3rd Floor, 24, Commander-in-Chief
Road, Madras 600 105.
Phone: C/o. 471659.
Telex: 041-6290 CWLY IN.

*Printed at:*
Sevak Publications,
25, North Mada St., Thiruvanmiyur,
Madras 600 041.

Fast Print Service,
307/308, Shri Hanuman Indl. Estate,
G.D. Ambekar Road, Wadala,
Bombay 400 031.

**Subscription Rates:**
**(Inclusive of Postage)**
India: Rs. 400.00
Foreign: US$ 175.00 (Air Mail)
US$ 75.00 (Sea Mail)

***Subscription charges payable in advance in favour of SEVAK PUBLICATIONS***

## CONTENTS

Heralding the 21st Century: A dominant role for world Liquefied Natural Gas (LNG) trade — T.P.S. RAJAN 41
Chemarena — S.L. VENKITESWARAN 45

### IN THE NEWS

Bombay Dyeing, IPCL in a jam: Paraxylene supplies dry up in global markets 50
UB acquiring British Chemical Co. 50
US tech tie-up for Bombay Dyeing expansion cleared 51
Caprolactam: Neck and neck race on 52
Methanol as fuel: Panel appointed to assess viability 54
Theophylline supply: Chinese dumping hits local units 67
Colour-Chem: Satisfactory performance 77
TN's alcohol policy affects chemical units 82

### PHARMACEUTICAL CAPSULE

Chemicals exporters doubtful of target 55
Drug companies seek more say in DPCO panel 68
Govt. decides to broaden list of category I drugs 70
Karnataka Antibiotics exports rise 87

### OIL AND NATURAL GAS SCENARIO

Call to modify gas pricing 48
Dalmias also in fray for Assam cracker project 57
Haldia Petrochem complex: IDBI not to ease lending norms 58
Charter hire of drillship: ONGC stayed from cancelling LI 78
Rs. 50 crore ONGC effort to locate oil in Bay fails 79
Concession to trap FIs for rupee funds: Centre not to extend forex loan to Haldia 81
Crude supply: Malaysia comes to India's rescue 88
No petrogoods price hike now 88

### FERTILISER NEWS

New tech. for fertiliser plants: Govt. to cut MEC 73
Tata Chem, Zuari Agro may lose gas based fertiliser projects 74
Fertiliser projects: GAIL restrained from cancelling allocations 75
Rs. 170 crore FCI revamp plan: New lease of life for two units 76
Paradip Phosphates plant almost complete 84

### REGULAR FEATURES

A Rapid Wrap Up of What's New in Operations, Products and Processes 61
Highlights in Chemical Technology 91
Science Briefs 97

### SPECIAL ARTICLE

Industrial and Export Opportunities of other Petrochemicals — P.S. BALASUBRAMANIAN 105

### SUPPLEMENT ON LEATHER PROCESSING

Directions of Leather Research in Nineties — A Forecast — T. RAMASAMI 113
New Products 120
Leather Abstracts 121
News from Abroad 121
Indian Leather Scene 122

### INTERNATIONAL SPECTRUM

New Developments from Japan 125

### MARKET INFORMATION

Bombay Chemicals Market 129
Bombay Dyes Market 134
Delhi Market 136
Madras Market 137
Calcutta Market 137
Shipping News 138
Materials Imported/Exported 141

**ASPIRIN IP/BP**
**SALICYLIC ACID IP**
**SALICYLIC ACID Tech**

of

**The Andhra Sugars Ltd.**

also available

**MAGNESIUM HYDROXIDE N.F.**
**MAGNESIUM TRISILICATE IP**

**SHREE ENTERPRISES**
**(CHEMICALS) PVT. LTD.**

A Shree Group

801, Dalamal Towers, 211, Nariman Point, BOMBAY-400 021.
PHONES: 231336 □ 231308 GRAM: "ANHYDRIDE" TELEX: 011-5179

CHEMICAL
WEEKLY

VOL. XXXV AUGUST 28, 1990 NO. 51

## HERALDING THE 21st CENTURY - 64

# A dominant role for world Liquefied Natural Gas (LNG) trade

Till the emergence of North Sea Natural Gas as a large scale supplier of gaseous hydrocarbons in the sixties, the British gas industry depended on coal and petroleum oil fractions as the primary feedstocks. Liquefied Natural Gas was being used as a means of peak shaving by the piped fuel gas industry for nearly three decades. The British Gas Council pioneered in 1962, the import of LNG by sea transport from Algeria in North Africa to the Convay Island. In 1966, there were about 30 LNG storage facilities in existence in the United Kingdom, USA, France and Algeria, with capacities varying from 500 to 60,000 tonnes. Large diameter pipelines are cheaper over LNG upto a distance of 3000 miles overland and 1000 miles, if largely under sea. Above these distances the capital investment and volume of gas needed to drive the compressor tend to favour liquefaction. LNG as a method of transportation of gas supplies suffers from inelegance in that the gas has to be liquified, stored at low temperature and then revapourated before use. Typically one eighth (12.5%) of the produced gas is consumed during liquefaction, shipping and evaporation before reuse.

Liquefaction of natural-gas reduces its volume to about 1/600th of the volume of gas under standard conditions. LNG tankers carrying 165,000 M$^3$ (approximately one million barrels) are being built for shipping LNG over distances of 4000 to 6000 miles. Such tankers may cost around $300 million. In 1978, the cost of a 125,000 M$^3$ capacity LNG tanker used to be quoted at $100 million. Current reports indicate that there are about 175 tankers on the world sea routes. LNG schemes are highly capital intensive and require complicated, contractual and financial arrangements between producers, shippers and users. The arrangements are to be made normally for 15 to 25 years for which the Government and financial institutions of both the countries have to participate.

Between 1965 and 1979, international trade in LNG grew at an impressive rate of about 30 percent. Algeria emerged as a LNG exporter in 1965, Alaska in 1970, Brunei and Libya in 1975, Abu Dhabi and Indonesia in 1979. The down trend in the trade since 1979 reflected the break-down and consequent interruption in supplies from North Africa to certai American and European countries due to political reasons Due to this, a large number of LNG projects that were proposed during the 1970s, for one reason or another, failed t materialise. These included proposals of LNG exports from Iran to USA and Japan, from Indonesia, Alaska and South America to USA, and from USSR to the USA and Japan Had these proposals materialised, the total LNG trade by 1990, could have been more than 200 milliard M$^3$ per annum (one milliard metre$^3$ pa = 725,000 LNG pa).

Even under more conservative conditions, forecasts made in the early 1970s expected the world LNG trade to reach a level somewhere in the range of 100-150 milliard by 1990. The fact that even these lower forecasts went wrong indicates that, like the crude petroleum, the LNG trade also is affected by political considerations. Until 1984, the United States was the world's largest gas consumer, when the USSR became the world's largest consumer overtaking the US; some 40% of the world's proven gas reserves in 1984, were located in the USSR around half of which were in three super-giant fields, Urengoy, Yamburg and Bovancenkovskoye, in Siberia. Around one third of the world's proven natural gas reserves are located in Africa and Middle East. This is one area in the world where the maximum quantity of gas is being flared.

Iran possess nearly 15% of the world's proven resources of natural gas (as estimated in 1984). Algeria's large reserve base of some 3000 milliard cubic metres of proven reserves, mainly non-associated gas, could enable a major expansion of both local use and exports. The trans-Mediterranean pipeline to Italy, in operation since 1983, has an export capacity of 12 milliard cubic metres and work has begun to increase its capacity by installing a parallel pipeline. Spare liquefaction capacity is also available for additional LNG exports to the United States and West Europe. Apart from the recently commissioned Australian North West Shell project, there are no new base-load projects under construction today, although several are being actively planned of which the Nigerian project is the most advanced. In addition, a number of existing projects are being expanded to meet new contractual commitments. The LNG industry is at crossroads. Will its future be confined mainly to expansions and/or extensions of existing projects, which implies a relatively modest rate of growth, or can we expect with reasonable certainty the mounting of a series of new projects in the coming years? Although total international LNG trade only comprised some three per cent of the world's consumption of natural gas in 1988, nevertheless it is regarded by many as being the gas industry's most exciting and technically demanding activity.

**The United States.** Total US annual gas consumption fell from over 20 tcf in 1979 to a low point of about 16 tcf in 1986. The greater part of this decline was in the industrial and power generation sectors. More recently, however, i.e. in 1987 and 1988, consumption has increased again by some 5% per annum. Total deliverability capacity has exceeded annual consumption -- the so called "gas bubble" -- since 1979/80 reaching a peak of over 4 tcf in 1983. Since then this excess capacity has declined progressively with the current expectation that it could virtually disappear within the next year or two. While Mexico has large gas reserves, it has chosen, like Saudi Arabia and some other countries with significant oil and gas resources, to maximise the use of gas internally so as to free up as much oil for export as is possible. This is not to imply that Mexican gas will never be exported to the USA in the coming years, but simply that the volumes involved are likely to be relatively modest.

**Four import terminals.** Imported LNG can supplement US indigenous production and Canadian and Mexican pipeline gas. Fortunately, the USA already has four LNG import terminals. These are the relatively small capacity one at Everett, Massachusetts which is operational, and the larger capacity terminals at Cove Point, Maryland; Elba Island, Georgia; and Lake Charles, Louisiana. The newer three terminals were moth-balled between 1980-1983 but are now expected to be recommissioned. Without any expansion/modifications, these four terminals could probably handle somewhere between 15 and 20 million tonnes of imported LNG pa in a continuous base-load mode type of operation. From the supply point of view, North Africa (Algeria) and West Africa (Nigeria), followed a little later in time by South America, the Caribbean, Northern Europe (Norway) and possibly even the Middle East, are all prospective supply sources. Under the high case assumptions the fundamental constraint to further growth beyond somewhere around 17 million tonnes p.a., is expected to be USA LNG import terminal capacity, rather than pricing levels or the willingnes on the part of prospective LNG exporters to supply. Expanding some of the existing terminals should not be too difficult, but the building of new terminals in market desirable locations, will not be easily accomplished. Overall, there is no guarantee that the USA will become a significant importer of LNG but most signs point to the fact that it will.

**West Europe.** Demand in terms of volume and end-users varies significantly from one country to another. For example, in the UK, Europe's biggest and the world's third largest gas market, the public distribution sector represents some 60 per cent of total gas consumption with virtually no gas being used currently for power generation, whereas in Italy, Europe's fourth largest market, the percentages are 42 and 18 respectively. Some countries, e.g. the Netherlands, Norway and Denmark, are net exporters, others like Belgium and Sweden rely entirely upon imported gas, while yet others e.g. Germany, France, Italy, etc. have indigenous production but need imports as well. For Europe as a whole, roughly one-half of current consumption is supplied by gas traded across national boundaries. At the wholesale supply level the Continental European gas market is largely conditioned by the interaction of the four main suppliers -- the Netherlands, Norway, the USSR and Algeria, which supplied collectively about 60 per cent of total consumption in 1988 -- with the major buyers. In West Europe as a whole, the UK is also a major player in volumetric terms, but apart from limited imports from Norway it remains as yet largely self-sufficient.

**Algeria.** Algeria, already one of the world's top gas exporters, plans to double sales during the next decade. The officials predict growing demand for gas in the USA, western and central Europe and in neighbouring Maghreb states linked to Algeria in a regional economic group. Sonatrach's -- the Algerian energy group -- ambitious plans include new natural gas pipelines to Europe and new production facilities, to be financed largely with foreign money. "Our vision is very clear," said Sonatrach deputy general manager Mustafa Faid. "By the year 2000 we aim for an export capacity of 60 bcm a year of natural gas and LNG. We also have plants to double LPG export capacity to seven million tonnes annually," he said. Last year Sonatrach exported a record 17.2 bcm. of LNG, up 20 per cent over 1988, making it the world's second largest exporter after Indonesia. Natural gas exports climbed six per cent to 12.2 bcm. With Algeria's oil output likely to remain steady at about 750,000 bpd, rising gas revenues will play a vital role in pulling the country out of its economic crisis. Algeria's proven natural gas reserves of nearly three tcm are the largest in Africa and the seventh largest in the world. World demand for gas is rising as environmental concerns prompt consumers in industrialised countries to switch from more polluting fossil fuels. Sonatrach are on the verge of signing a contract with USA and French firms to revamp and expand gas liquefaction plants at Arsow on the Western coast and Skida in the East. Mr. Faid said work would be completed by the end of 1992, boosting total LNG capacity to 33 bcm a year from around 25 bcm. Construction of a new LNG unit of around five bcm a year was planned by the turn of the century. Mr. Faid projected LNG sales to the USA at 12 bcm a year by mid-1990s up from 6.7 bcm now. Natural gas exports are to be doubled in the coming decade from 30 to 40 bcm a year through construction of a pipeline to Spain and expansion of an existing one to Italy. Italy, Algeria's largest natural gas buyer, has agreed to help add a fourth line under the Mediterranean from Tunisia to Sicily to expand deliveries from East Algeria's giant Hassi R'Mel Field.

The project, due for completion by 1993, would boost capacity to 22 bcm a year from 16 bcm. He said the planned pipeline to Spain via Morocco would be able to handle eight to nine bcm annually by 1996 and up to 20 bcm in the year 2000. Potential buyers Sonatrach is contacting included, Portugal, Spain, France, West Germany, Britain, Belgium and Switzerland. Mr. Faid said Portugal, Spain and Morocco alone could take up to 8.5 bcm a year through the line. LPG output, not including that from refineries, is also set to double from an annual four million tonnes currently through expanded gas production, greater LPG extraction and construction of new treatment facilities. Currently, LNG imports comprise a relatively modest 6 per cent of total European gas demand but are much more significant for France (32 per cent), Belgium (35) and Spain (86). Recently, other countries such as the UK, Italy, West Germany, Greece, Turkey and Portugal have either committed themselves to import LNG or have expressed serious interest in such supplies. Although Europe currently has adequate supplies available under contract to meet its future needs up until about the second half of the 1990s, thereafter a supply demand gap will start to open up. While substantial additional volumes of gas could be supplied from the USSR, Norway and Algeria, increasing reliance on only a few sources, does not sit very comfortably with many utilities for whom security and diversity of supply rank high in their long term strategic planning. The recent conclusion of contracts by the UK, Greece and Turkey for new supplies of Algerian LNG, mainly for peak-shaving purposes, is evidence that LNG is not regarded by importing gas utilities as being insecure. And the serious interest that is being shown in base-load supplies of Nigerian LNG reinforces this fact.

**The year 2000.** So what is likely by say the year 2000 and beyond? Undoubtedly, more gas over and above the existing contractual commitments will be provided from uncommitted North Sea resources, notably from the Norwegian and UK sectors. In addition to any new deals, existing contracts with the USSR will probably be extended when their time expires and quite possibly expanded volumetrically to some degree if relations between the West and the USSR continue to improve. Likewise, Algeria will no doubt supply more gas by pipeline and/or as LNG. Under the high case it is assumed that growth in demand (for gas) will be helped by the development of the new emerging markets of Scandinavia and Southern Europe, and by deeper penetration of the public distribution and industrial sectors in a number of established markets, always provided gas remains price-competitive with alternative fuels. Similarly, gas should also make inroads in the power generation market based on combined cycle technology, particularly in those countries where environmental pressures are strong and/or where nuclear power has fallen out of favour. Like the USA, one factor favouring LNG is the availability of import terminals and related infrastructure in France, Belgium, Spain, Italy and the UK. Most of these terminals are either under-utilised and/or can be readily expanded. Greece and Turkey will soon have their own terminals, while it is likely that new terminals will be built in the UK, Portugal and West Germany. Existing capacity could handle all the low case volumes through to 2010, while expansions planned terminals would be more than adequate to cope with the high case quantities. As to LNG supplies, in addition to Algeria and Libya, and Nigeria from 1995, prospective sources include Norway, South America, the Caribbean and the Middle East, although under the high case there may be a strong competitive pull from the United States on some of these sources for logistical/economic reasons.

**Japan.** Japan is, and will continue to be, the world's largest market for LNG. Since first deliveries in 1969, imports have built up to a level of about 30 million tonnes in 1988. But after allowing for the absorption of the newly commissioned Australian NW Shelf project, the general perception until a year or two ago was that future increases in the demand for LNG would probably be fairly modest and met largely by expansions of existing supply sources. This reflected the expectation of a depressed economic outlook following the oil price collapse of 1986 and the sudden appreciation of the Yen. However, more recently opinions in both govermental and private industry circles on future prospects for LNG have started to become more optimistic once again.

**Growth Prospects.** The factors favouring growth are in most instances are not confined to LNG, but also apply to the international trade in pipeline gas:

* The expectation that in a number of important gas markets indigenous supply availability will be insufficient to meet medium to longer term demand.
* The development of new markets in the Pacific and Atlantic Basins, including the expansion of existing markets.
* Mounting environmental pressures which tend to favour natural gas (LNG) with its 'clean' burning characteristics over most oil products and coal.
* Increasing governmental and or public resistance in many countries to nuclear power including in some instances, the closure of existing stations.

**Potential constraints.** There are, of course, some other possible developments which, if they were to materialise, could constrain growth in LNG (and pipeline gas) trade. These include:

* A sustained period of low oil prices which could postpone indefinitely the development of many prospective high cost sources of gas supply. Equally, however, other high-cost energy supplies would also suffer.
* A prolonged abundance of low-priced crude oil supplies, and a growing availability of low-cost coal, with consequential fierce inter-fuel competition resulting in continuous pressure on prices and margins.
* A downturn in economic activity, especially in those countries where gas is already or could otherwise become a significant component of energy supply.

Today there are more factors working in favour of the LNG industry than against it. This situation may not last indefinitely, but if the opportunities are grasped quickly, there is no reason why international LNG trade should not at least double, possibly treble itself in volumetric terms, over the next 20 years.

— T.P.S. RAJAN

(Source: *Gas World*, April 1990.)

FOR YOUR REQUIREMENTS OF

**BENZYL ALCOHOL IP/FFC**
**BENZOYL CHLORIDE**
**IBUPROFEN IP/BP**
**ACETYL CHLORIDE**
**FERRIC AMMONIUM CITRATE I.P.**
**METHANOL** (Original) in Drums & Tanker Load
**IPA, ACETONE, BENZENE, TOLUENE, XYLENE** (Original & Recovered)
**EDC, TCE, MDC, MEC** (Original & Recovered)

Please Contact:

**M/s. SHREE CHEM INDUSTRIES**
2/4, Kubal Niwas, Gokhale Road (N)
Dadar, Bombay 400 028.
Tel: 4300266 & 456868

* We also undertake distillation jobworks.
* We also buy Surplus, Crude, Spent & Waste Solvents & Chemicals.

WE OFFER YOU BEST QUALITY & COMPETITIVE RATES

**BORIC ACID**

**BORAX - GRANULAR * BORAX - CRYSTAL**

Authorised distributor for Maharashtra
**BHANSALI CHEMICAL MANUFACTURING CO.**
MADRAS

Please Contact:

**KANTI TRADING COMPANY**
339/41, Samuel Street, Rawal Chamber, 4th Floor, Vadgadi, Bombay 400 003.
Dial: 325623/344219

*Our Associates:* **RAJESH DYE CHEM CORPN.**
(Dealing in: SOLVENTS & CHEMICALS)

We Ensure Quality

ALWAYS USE PIPICOL RANGE OF ADHESIVES

1. Poly Vinyl Acetate Emulsion
2. Pressure Sensitive Adhesive
3. Lamination Adhesive
4. Anti-Foam (Castor Oil Based)
5. Acid Slurry (88%-92%)
6. Liquid Detergent
7. Manganese Di-Oxide

For Details, Contact Manufacturers:

**JAGDISH ORGANIC & CHEMICALS**
'A' Block, IInd Floor, Butler Plaza, 95, Civil Lines, BAREILLY - 243 001
Phone: 75927, 79494

# CHEMARENA

## S.L. VENKITESWARAN

# Butyl Rubber and other projects

Government seems to have taken a final decision on the roject for butyl rubber and to entrust it to Modi Rubber. here were many proposals and even Letters of Intent issued. ther contenders were UB Petroproducts (of Mallya Group) or location in Vizakhapatnam, Andhra Pradesh and Relince Petrochemicals at Hazira, Gujarat. Most applications ave referred to the technology from USSR either through n Italian party or directly. No reliable data on new material vailability were given. While the Modi Rubber project is o be at Kosikalon in UP with supplies of isobutylene from ne Mathura Refinery and Reliance would have its own $C_4$ tream of the cracker, the project at Vizag has no such supply f isobutylene until and if the naphtha cracker at Vizag gets inally cleared. UB Group proposed to import MTBE to split to isobutylene and methanol with methanol going for nother of their programmes viz. Methyl Methacrylate. Such way of getting raw material based on import is certainly ot worth consideration and was presumably not considered s isobutylene is not available readily. There is a co-monomer soprene to the extent of 5% for butyl rubber and presumbly this will be imported.

The Modi programme is for a capacity of 25,000 tonnes world scale) and at an investment of a massive Rs. 300 rores. USSR is to be an investor wth 40% of equity besides ne supply of technology. One would hope for quick progress on this import saving project.

### Methacrylates

Another plastic monomer methyl methacrylate (MMA) has een the subject of many programmes and approvals. Presently MMA is made by GSFC who took over the Polymer Corporation of India which was set up for an MMA/PMMA project in Gujarat taking advantage of the hydrogen cyanide by roduct of acrylonitrile production of IPCL. PCI was in trouble in getting on with any reasonable level of production and ltimately got into the fold of GSFC. But even so its problems took years to get resolved and a level of 4,000 TPA as been apparently established. But half of the hydrogen yanide from IPCL could not be utilised and IPCL contracted or this 50% with GACL for sodium cyanide and perhaps yanuric chloride. This left no chance for expansion of GSFC's MMA plant or going over to the acid and other items. his situation has led to a scramble for capacities with UB Petro, ICI and several others jumping in. There are serious reservations about cyanide and cyanide based chemicals but they could be set up under very tight fool-proof safety standards. No decision appears to have been taken on new plants for MMA whether based on cyanide or alternate feedstock olefins which avoid cyanide and are based on oxidation with special catalysts. This alternate technology based on $C_4$ or $C_3$ olefins is yet to be tied up. However while a lot of new capacity based on $C_3/C_4$ olefins have made their advent, the three largest world producers — ICI, Du Pont and Rohm & Haas — seem to be satisfied with cyanide based production and have capacities of several hundred tonnes a day each. Japan is reported to have over 350,000 TPA capacity at present for this very important monomer. India is yet to finalise its efforts for getting above the tiny capacity level of 4,000 TPA. Investments including cyanide may be near 100 crores for 15,000 tonnes of methacrylic acid and esters.

### Isocyanates

TDI and MDI are the gateway to the field of the polyurethanes — with their wide range of applications, both flexible and rigid foam material and for other special resins. Efforts to establish TDI capacity in Gujarat in the Seventies did not fructify and in recent years HOC has been actively pursuing MDI as a diversification of their aniline and formaldehyde plants. After several years efforts technology for both TDI and MDI are available from one of the world leaders Du Pont, for licensing and HOC as well as others including ICI are in the field for approvals of capacity not less than 10,000 tonnes each. Two aspects are important. The production and use of phosgene under totally safe and closed circuit designs to avoid any chance whatever of a repetition of Bhopal tragedy. Efforts to make TDI by other than the circuitous nitro/amino/phosgenation steps have not yet materialised and we cannot banish phosgene (as also cyanide) from the chemical industry if we are to get some high value products which includes polycarbonate besides isocyanates (both via phosgenes) and MMA (based on cyanide). There is need to accept the use of phosgene if we are to takeup the manufacture of TDI and MDI now.

The isocyanate projects are complex and require several auxiliary chemicals in large volumes to be produced and used captively. For TDI the base is dinitro toluene reduced to the diamine by hydrogen while for MDI the base is nitrobenzene reduced to aniline and then reacted with formaldehyde to get methylene bis dianiline (para). The diamines are reacted with phosgene derived from carbon monoxide and chlorine and the by-product hydrogen chloride has to have a useful outlet. Hence an integrated complex for either TDI or MDI requires nitric acid, carbon monoxide, hydrogen, chlorine and an outlet for HCl. Chlorine means caustic soda as well. And formaldehyde is additional for MDI. The investment on such a complex of products to end up with 10,000 to 15,000 TPA of either may be over Rs. 200 crores (including caustic/chlorine). To have both together at one location may lead to marginal reduction in investment.

## Polyacetal

Another plastic material which has been under expectations of local production is polyacetal based on formaldehyde. Hopes of indigenous technology development have led nowhere and probably import of technology was difficult for parties for whom capacity was approved. Now it is reported that Polyolefins Industries (PIL) will go ahead with a project for polyacetal of the trade name CELCON with technology licence from Hoechst-Celanese, who are their principals and a leader in this area. Technical collaboration is approved and PIL has already a third share of its equity from Hoechst. So we may look forward to this engineering plastics from Indian production in two years.

## Other Engineering Plastics

Other engineering plastics including polycarbonate are expected to come up in the next 2 or 3 years in a joint venture of IPCL with General Electric of USA who are leaders. Much as we would like to get indigenous efforts fruitful for the sophisticated speciality plastics it seems that it may be a long-drawn process and tie ups with world leaders may be the only way to get going earlier.

## Other Chemicals

One of the other petrochemicals which has also been the anvil for some time is epichlorohydrin along with sy thetic glycerine based on propylene and chlorine. Little pr gress could be made and now it is reported that such programme with a caustic soda-chlorine project in Tan Nadu has been proposed. But the problem is a location away from propylene, apart from the fact that there is no r source of it in the south. Propylene of Madras Refinery a tied up fully for the propylene oxide plants while the pr pylene of Cochin Refineries is linked to the HOC Phen acetone plant. It is difficult to envisage a successful pr gramme for epichlorohydrin/glycerine in the far southe corner of Tamil Nadu though it is ideal for caustic sod chlorine. We should not have to base production on impor of propylene and if the Haldia cracker can meet the nee of this project through tanker loads it would be fine.

It is necessary to take early decisions and approve the projects or defer one or both depending on the overall resou ces/foreign exchange situation. The only relief is that the is little import involved for the production and it is near tot import saving. But current imports of TDI/MDI will be f less than proposed capacities. We have already two plan for propylene oxide/glycol/polyols, required as the co-ra materials for polyurethanes. The need for effective use of th capacity will mean larger imports of TDI/MDI in the comin years until production is established.

There are these second level basic intermediates and pe rochemicals not linked to any cracker or olefins -- Buty rubber (linked to refinery), methacrylate, isocyanates, cap rolactam, DMT/PTA, phthalic anhydride etc. which also nee heavy investments but yield better returns. There is need t expedite these projects which are not dependent on naptha gas crackers for their starting material.

For Competitive Imports of Chemicals, Pharmaceutical
Raw Materials and Particularly for the Following Items

**Cyanuric Chloride**
**Chloroform**
**Aniline**
**Acetanilide**
**Beta Naphthol**
**Benzaldehyde**
**Crude Iodine**

PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

**CHEMET**

HEAD OFFICE:
Taj Building, 1st Floor, P.B.No. 195, 210, Dr. D.N. Road, Bombay: 400 001
Phones: 2043803/4/5/6/7 Fax. No. 2048854
Cable: DEGUCHEM Bombay Telex: 11-3229/11 4631 DGKM IN

CALCUTTA OFFICE:
Sharma House, 3rd Floor, 1/2 Lord Sinha Road, Calcutta-700 071
Phones: 447306 ■ 446155, Cable: DEGUCHEM Calcutta, Telex: 21-33 25 DGKN IN

MADRAS OFFICE:
10, Kondy Chetty Street, 1st Floor, P.B. No. 1709, Madras 600 001. Cable: DEGUCHEM, Madras
Phones: 582447 ■ 587617 ■ 580796 Telex: 41 7554 DGKM IN

DELHI OFFICE:
214, Hans Bhavan, Wing No. 1, Bahadurshah Zafer Marg, New Delhi - 110 002
Phones: 3311373 ■ 3319787 ■ 3319791 Cable: DEGUCHEM New Delhi,
Telex:31 65921, DGKM IN.

HYDERABAD OFFICE:
905/2, 9th Floor, Babukhan Estate, Basheerbagh, Hyderabad-500 001.
Phone : 242318, Telex: 0425 - 2188, DGKM IN.

# Call to modify gas pricing

Mr. Jagdish S. Jhaveri, president of the Gujarat Chamber of Commerce and Industry, in a detailed memorandum submitted to Mr. M.S. Gurupadaswamy, Union Minister for Petroleum and Chemicals, has emphasised that the new formula for pricing of gas as recommended by the Kelkar Committee is not only unscientific and arbitrary but also unjust and unfair for the future industrial growth of Gujarat and hence should be dropped.

The chamber chief has pointed out that the gas price should not be fixed on the basis of the thermal equivalent of fuel oil as recommended by the Committee but on the basis of the pit head price of coal.

The price of gas fixed by the Committee is inconsistent with the price prevailing in Europe where gas is transported over a long distance ranging from 6000 km to 15000 km, i.e., Italy Rs. 1550, Netherlands Rs. 1632, West Germany Rs. 2087 and France Rs. 2187 per 1000 cu.m.

Mr. Jhaveri's memorandum stressed that following the Supreme Court's decision, ONGC has demanded from industrial consumers of Baroda a price of Rs. 2503 per 1000 cu.m of gas since 1982, which is not only contrary to the Government notification in this regard but also discriminatory as well. It is bound to result in the closure of 20 industrial units in Baroda rendering 30,000 workers unemployed, a situation which can hardly be viewed with equanimity.

While deprecating ONGC's move, Mr. Jhaveri has stated that ONGC is a public sector enterprise which should take public interest into account and should not act as a super monopolist in respect of pricing of gas.

Gujarat is entitled to the natural benefit of low cost fuel found in its territory as the benefit of coal is available to Bengal and Bihar and that of hydropower to Maharashtra and Karnataka. As regards diversion of gas, Mr. Jhaveri has advocated that Gujarat is not against any other State using gas found in Gujarat but we certainly want that the State's requirements should be met first.

This is imperative as Gujarat has no other cheaper source of energy. Considering the severe problems of linkage and price of coal faced by Gujarat and the heavy cost of electricity due to huge thermal capacity and high price of coal transported over longer distance, Mr. Jhaveri has urged that adequate and regular supply of gas at reasonable rate be ensured for power generation in Gujarat as also for industries and the domestic sector.

According to him, the gas-based power station at Gandhar has been sanctioned by the Union Government while the gas-based power station at Pipavav is awaiting sanction of the Planning Commission. In order to help power generation in Gujarat to cope with the rising demand, necessary sanction to the Pipavav gas-based power plant should be accorded by the Planning Commission at the earliest, felt Mr. Jhaveri.

When 17 mcm of gas valued at about Rs. 1800 crore is being flared in the country every year and when the share of the western region, including Gujarat, is above 70 per cent, it is highly essential to provide for additional gas handling facilities and ensure identification of potential users both on confirmed as well as fall-back basis, so that the flaring of gas could be reduced to the minimum.

**IIChE SEMINAR ON CHEM CAL INDUSTRY:**

The Indian Institute of Chemic Engineers (IIChE) is organising one day seminar focussing on th developments in the chemical indu try of India, in Bombay on September 14, 1990. The Dr. H.L. Ro Centenary seminar is proposed t cover the field of: Petrochemical Synthetic Fibres, Polymers, Fertilisers, Fine Chemicals, Oleo and Performance Chemicals. The Association proposes to bring out a souvenir containing the papers/abstracts to be presented in the seminar and seek support from members of the chemical industry. For further details contact: Professor K.K. Tiwari Department of Chemical Technology, University of Bombay Matunga, Bombay-400019. Phone (Off) 4112391/4114302-07.

## OIL MAKES 2 DISCOVERIES

The Oil India Limited (OIL) had made two major discoveries of hydrocarbons during the last financial year including the high yielding gas structure in Dandewala in western Rajasthan where gas flowed out at the rate of 55 cubic metres per day. The second di covery was in Assam, oil sources sai The crude oil discovered in the eocen structure at Dikom had been an exci ing find as it had opened up new avenues for exploration in the deeper eocen prospects in the entire upper Assa region.

The sources said the year 1989-9 witnessed several notable achievement on the technical front such as in-hous three-dimensional survey, introductio of oil tubing and nitrogen pumping uni for well servicing, advanced research and development (R and D) in the search for shale oil, commissioning o the country's first indigenous 3000 H.P. drilling rig, completion of the pipeline to transport crude oil from Arunachal Pradesh and commencement of work for the country's first gas storage and reproduction scheme in Assam. OIL sources claimed that their performance in 1989-90 was the best in the seventh five year plan period with the gross profit being the highest ever in the plan period. The gross income during this period was Rs. 668 crores and the gross profit Rs. 122 crores.

For your import requirements of

**Marlophen 89**
**Gohsenol GH-17**
**Alumina**
**Activated Carbon (Granulated)**
**MEK**
**Propylene Glycol**
**Melamine**
**Octoates/Naphthanates**
**Methacrylates**

**PRIYA CHEMICALS**

HEAD OFFICE:
Podar Chambers, 4th Floor, S.A. Brelvi Street, Bombay 400 001
Phones: 2860596 ■ 2863611 ■ 2863676 ■ 2863783 ■ 2863900
Telex: 0118-5495 PRIA IN ■ 0118-6556 PRIA IN ■ 0118-2472 PODR IN

BRANCHES
— HYDERABAD OFFICE —
Prashanthi Commercial Complex, 6-9-30/6 to 8/B, 2nd Floor, Basheerbagh,
Hyderabad - 500 029 Phone: 236068

— DELHI OFFICE —
Flat No. 8, 10th Floor, Akash Deep Bldg., Barakhamba Road, New Delhi 110 001
Phones: 3314512 ■ 3310413

— BANGALORE OFFICE —
Devatha Plaza, 131/132, Residency Road, Bangalore 560 025 Phone: 214027

— MADRAS OFFICE —
5-J Century Plaza, 560-562 Mount Road, Teynampet, Madras 600 018
Phone: 451597 ■ 451031 Telex: 041-8809 PRIA IN

— CALCUTTA OFFICE —
"LORDS", 3rd Floor, 7/1, Lord Sinha Road, Calcutta 700 071
Phone: 222378 ■ 222379 ■ 228015 ■ 226367 ■ 300765

## BOMBAY DYEING, IPCL IN A JAM

# Paraxylene supplies dry up in global markets

Bombay Dyeing and the public-sector Indian Petrochemicals Corporation are in a jam. Both are scouting the international markets for paraxylene, a commodity which seems to have suddenly disappeared.

As a fall-out of the Iraq-Kuwait imbroglio and the uncertainity over international crude prices, the surplus paraxylene inventory has suddenly disappeared from the global markets. Whenever it is available, the C & F price has climbed by around $70-80 in a week.

The second quarter of 1990 closed with Japan carrying around 80,000 tonnes paraxylene inventory with several new plants coming onstream. Overall, paraxylene markets were marked by a general build-up of inventory and weakening spot prices in Europe.

During June, 1990, IPCL finalised a 1500 tonne consignment at a C & F price of between $428 and $430. Bombay Dyeing also finalised a 4000 tonne contract at around the same time at the rate of $420-425 per tonne C & F basis.

Currently being quoted at around 4500 per tonne C & F, the landed cost of paraxylene works out to about Rs. 16,500 per tonne. However, with all the additional paraxylene having already gone underground, there are chances of prices firming up further in the international market. Traders and other sellers have adopted a wait-and-watch stance with the hope that the situation in the Gulf might worsen.

IPCL seems to have a comparatively comfortable supply position. It had also finalised during June a 5000 tonne consignment for July delivery at $360-365 f.o.b. This worked out to around $415 per tonne C & F. IPCL's deal at that time seemed to have destabilised the Rotterdam markets.

However, even after dedicating its expanded xylene capacity to the nation recently, IPCL might not be in a position to manufacture paraxylene immediately for captive use. It might, therefore, have to look overseas again for supplies, once it's July-arrival paraxylene runs out.

Bombay Dyeing's consignment is also not expected to last very long. At that point, it will have to purchase additional licences from the open market at a premium and go in for imports. In fact, Bombay Dyeing might even prefer to go in for imports as at present rates of $500 per tonne C & F, it will work out to be more cheaper than IPCL's admitted fair selling price of Rs. 21,000.

It seems now East Asian paraxylene producers will not fully utilise their capacities. They will also try to sell all the stock in East Asia itself. At the beginning of the third quarter, discussions were held for smoothening the demand-supply imbalance in paraxylene for achieving price stability.

However, the status of all the agreements has become uncertain now.

---

## UB ACQUIRING BRITISH CHEMICAL CO

The UB group is all set to acquire a British chemical complex with three manufacturing units in paints and allied products for a consideration of £100 million.

Announcing this at a news conference, convened to declare a Rs. 10 crore rights issue of convertible debentures of the face value of Rs. 300 each for cash at par, the UB group chairman, Mr. Vijay Mallya said: "Since many a formality needs to be completed, the nam of the company being acquired will b announced later." In the UK it tak around six months to complete the fo malities prescribed by the monopo commission and other statutory law However, Mr. Mallya clarifed that in a other respects, the chemical group ha come under his care.

The UK chemical group will for part of Mallya's global, Berger J & group, with its operations spread acros 26 countries. He said Kerala Minera and Metal Co. Ltd., (KMML), a sic Kerala based PSU was considered b the J & N group for a possible takeove

He said since titanium dioxide is th major raw material that goes into th manufacture of paints, the UK grou which is to come under his care, wante to takeover the Kerala unit. He said "We have not taken any decision o that in view of the fact that the KMM has heavy losses and liabilities." If th liability was massive and the technol ogy had to be upgraded or replaced wit the latest, J and N group may not evinc interest in it.

Mr. Mallya confirmed that the UB group has grabbed the ailing Mangalor Chemicals and Fertilisers Ltd. (MCF and only the technicality of signing u of a formal memorandum of under standing with the government of Kar nataka and the IDBI led consortium o bankers remained to be completed. He said the draft agreement has reached al the three parties and may be formally signed in a short while.

The rehabilitation package, worked out by the state, the consortium of bankers led by IDBI and the UB group requires the UB group to pump in Rs. 10 crore immediately and another Rs. 10 crore after sometime, plus a Rs. 20 crore guarantee. The entire liability has been rescheduled by the consortium and would be repaid by the UB group out of profits to be generated by the MCF, Mr. Mallya added.

# US tech tieup for Bombay Dyeing expansion cleared

The Foreign Investment Board (FIB) has belatedly approved the technical collaboration between Bombay Dyeing and Glitsch, a division of Foster Wheeler Corporation of the US, for its DMT expansion project. The over two-year delay in approval has proved to be a blessing in disguise for Bombay Dyeing as the Glitsch tieup has reduced he project cost to Rs. 59.89 crores from Rs. 110 crores under the now abandoned collaboration with Huels Triosdorf of West Germany.

The technical collaboration with Glitsch, which was approved by FIB a ew days back, has also facilitated a foreign exchange saving of $5 million. The oreign exchange component of the proect cost is $16 million, compared with DM36 million (about $21 milllion) under the tie-up with Triosdorf.

Bombay Dyeing had submitted the roposal for tie-up with the West German company in 1988 to expand its atalganga-based DMT plant by 40,000 onnes to 100,000 tonnes per annum. he inter-ministerial technical evaluaion committee approved this collaboation for final approval by FIB. Bombay Dyeing, however, could not et this clearance apparently because the overnment had not made up its mind vhether DMT plants should be allowed o expand.

Unlike Bombay Dyeing, the two ther DMT producers, Indian Petrohemicals Corporation (IPCL) and ongaigaon Refinery and Petrochemials Limited (BRPL) have not decided o expand their units. IPCL, which had nce considered expansion decided gainst it because DMT's substitute, TA, is becoming popular the world ver due to its technical superiority.

One kilogram of PTA yields far more olyester than the same quantity of MT. The polyester manufacturers, thus, prefer to use PTA in a situation when the prices of both the intermediates are the same. With no new DMT plants being set up anywhere in the world, PTA will gradually become the dominant intermediate in the coming years.

Following the delay in FIB approval of the Triosdorf tie-up, Bombay Dyeing decided to submit a fresh application envisaging collaboration with Glitsch a few months back.

Bombay Dyeing representatives told the technical evaluation committee that Glitsch has proposed continued use of existing equipment of the DMT plant but with redesign and replacement of internals. Triosdorf, on the other hand, had proposed replacement of some major equipment like oxidisers. This engineering difference is the major factor for reduction in the project cost in the case of the Glitsch tie-up. Moreover, the knowhow and basic engineering fees sought by the American firm are 35 per cent lower than DM 14 million ($8.25 million) sought by Triosdorf.

## BHILAI STEEL FACING SEVERE COAL CRISIS

Bhilai Steel Plant is facing a serious coal crisis due to non-receipt of coal, according to a press release. Against Bhilai's daily requirement of 14,000 tonnes, in June 1990 the average receipt was 13,000 tonnes per day, which had gone down to 11,000 tonnes per day in July and has further deteriorated to 9,000 tonnes per day in August.

Coal stocks in the plant have depleted to a precarious level of 34,000 tonnes, as against 1,26,000 tonnes as on April 1, 1990. The minimum stock of coal required for operating the coke oven batteries is 1,30,000 tonnes.

**For the most competitive CIF price of**

**Perchloroethylene**
**Sodium Chlorite**
**Rangolite**
**Silicone Oil**
**Epichlorohydrine**
**and other chemicals**

**Please Contact:**

**Mr. DHAIRESH K. SANGHVI**

**M/s. KANTILAL SANGHVI & CO.**

3rd Floor, Union Co-operative Insurance Bldg.,
23, Sir Pherozeshah Mehta Road,
BOMBAY 400 001.
**Phones: (Office): 2870836/2873217/2873628**
**(Resi.): 4226850/4229086**
**Telex: 1185725 EXIM IM** **Gram: EXPIM, Bombay**
**Fax: (22) 2874153**

# Caprolactam: Neck and neck race on

In the next three years, two Rs. 600-crore caprolactam projects are proposed to be set up in the country by the private sector. One by the Modis and the other by Shrirams. Both propose to manufacture 50,000 tonnes of caprolactam per annum. Both are in identical stages of implementation. Both, the Modis as well as Bharat Rams, of Shriram Fibres, have tied up with the State governments of Orissa and Bihar, respectively, to set up the projects in the neighbouring States. And both have foreign collaborations and selected the sites. Even the Government is considering their applications for foreign collaboration (FC) and capital goods (CG) clearances, simultaneously. And both are confident of starting work on the projects by the beginning of next year, almost in tandem with each other.

However, almost ironically, these cannot possibly find co-existence as there is room for only one. Hence, the battle lines have been drawn as the aspirants race against each other, and time, to hit the market first. At stake would not only be the reputations of two most respected industrial families of the country but also their business fortunes.

While success could spell unchallenged supremacy for the winner, failure would be fatal for the loser. Their task is not made any easier by the ambitious plans that state organs like Gujarat State Fertiliser Corporation (GSFC) and Fertiliser and Chemicals Travancore Limited (FACT) have for setting up similar projects in near future.

While FACT's plant for manufacturing 50,000 tonnes is almost ready and is poised to be commissioned any time GSFC too is racing ahead with its plans to enhance the capacity to the only existing caprolactam plant in the country from the current 20,000 tonnes to 70,000 tonnes per annum.

FACT and GSFC, both plan to raise their capacities ultimately to 1,00,000 and 1,20,000 tonnes per annum, respectively. This, when the estimated demand for caprolactam is still a hotly debated matter in the country. However, demand estimates have varied between 1,25,000 tonnes and 1,75,000 tonnes per annum, not enough to support the entry of both the private sector plants.

Hence the battle lines are drawn. While the State corporations cannot be easily wished away, the choice of casualty falls on one of the private sector ventures. Which would it be, is the most important question that faces everbody in the industry today?

Shri Ram Fibres Limited, member of the erstwhile DCM Group, and now the flagship of Bharat Ram empire has entered into a joint venture agreement with the Bihar State Industrial Development Corporation and the Steel Authority of India Limited for setting up the project at Bokaro in Bihar. Supply of critical raw materials like benzene and ammonia has been tied up with SAIL.

Modis, on their part have tied up with the State Government of Orissa to set up the project in joint sector. They too claim, to have ensured unhindered supply of raw materials to the plant. Obtaining technology for caprolactam was believed to be among the more difficult task. The rivals had hoped to cut edges above others on this front. However, here too there was a tie.

There are four major companies in the world, who could supply the requisite technology. BASF, of Germany, DSM of Holland, Ube of Japan and a Poland government agency. While FACT and GSFC had selectively tapped these, SRF entered into technical collaboration agreement with the Polish company and IFP of France. Modis preferred to tie up with Ube of Japan. Their FC and CG applications are expected to be cleared sometime this year both the companies are confident of beginning civil works on the site by the beginning of next year.

Not only this, but the time for completion of their projects is also estimated to be about the same, sometime in 1993 That leaves only two counts on which they could possibly cut the competitio to size. Cost of the setting up the project and ensuring sale of products. O both these, the companies are maintain ing guarded stance. Mr. M.K. Modi eldest son of Mr. K.N. Modi, and Vice Chairman of the group claims that the estimated cost of their project is Rs. 50 crores. And the sale of products i ensured through production of end products.

On the other hand, the President o the Chemicals Division of SRF, M Ravi K. Sinha, claims that SRF would be able to put up the project at a substantially lower cost, at least Rs. 10 crores less than the Modi porposal, du to the sharing of facilities with Bokaro However, industry observers are sceptical about the differing claims. Mor realistic estimates put the cost a Rs. 600 crores. However, whether SR can in fact pull a rabbit out of its ha and reduce the cost by the claime Rs. 100 crores remains to be seen.

SRF has also claimed that it woul have no problem in reaching break-eve point in caprolactam because of its captive use in nylon industrial yarn production. SRF had announced its intentio of stepping up its nylon production t an unprecedented 30,000 tonnes pe annum. This, it claims would consum nearly 60 per cent of its caprolacta production and help it in reaching th break-even point.

However, there is one flaw in th SRF version. The nylon industrial yar industry is already facing a glut situation. In the present circumstances, it i questionable whether SRF would fin commercially prudent to commit furthe resources in nylon yarn business. An if it does not, then its claims on caprolactam use fall through.

FOR YOUR IMPORTS AT COMPETITIVE CIF PRICES

Melamine
Beta Naphthol
Aniline Oil
Sodium Nitrite
Barium Carbonate
Hydroxy Propyl Acrylate
Pyridine Pure 2°
Iodine
Sodium Bichromate
Dimethyl Sulphoxide
Methyl Chloro Formate
Piperazine Anhydrous
Dimethyl Sulphide
Stannic Chloride
Dimethyl Formamide
Alkyl Benzene Hard
Phenothiazine
Petroleum Ether 40/60 & 60/80
Thiourea
Lactose (Ex NCZ)
Propylene Glycol (Ex Arco)
1 Bromo 3 Chloro Propane
Thiophenol
3,4 Dichloro Nitro Benzene
Dimethyl Carbonate
Guaiacol
2,6 Diethyl Aniline
Methane Sulphonyl Chloride
Methane Sulphonic Acid
2,6 Ditertiary Butyl Phenol
Sodium Picramate
Picramic Acid
Succinic Acid

Please Contact for further details:

**S. AMIT & CO.**

A TRUSTED NAME FOR IMPORT OF YOUR CHEMICALS
105, Neelam Centre, "A" Wing, Hind Cycle Road,
Worli, Bombay 400 025.
**Phones:** 4934627-28/4933310
**Cable:** "DULICTOL"
**Telex:** 011-76877 CMIT IN
011-74486 AMIT IN
**Fax No.:** 22-494950-4
**Madras Office:** Queens Court, 134, Montieth Road, Madras 600 008.
**Phones:** 860172/866942
**Hyderabad Office:** 8-3-215/7 (First Floor), Srinivasa Nagar Colony (West),
HYDERABAD-500 890.
**Phone:** 35110

Our Associates: M/s. CHEM AMIT

METHANOL AS FUEL

# Panel appointed to assess viability

The Union government has appointed a committee headed by Gas Authority of India Ltd. chief Mr. Vineet Nayyar to expedite a decision on the proposal of blending methanol with petrol and diesel to reduce India's dependence on imported liquid fuels.

Others members of the panel are the chief executive of Engineers India Ltd., Projects and Development India Ltd. and the joint secretaries of the departments of environment and non-conventional energy sources.

Officials are now considering a proposal to blend five per cent methanol in petrol and 15 per cent in diesel. Methanol as a transport fuel is gaining popularity in United States and other developed countries as an environment-friendly fuel substitute for gasoline. To the Indian government, however, the main attraction has been that of reducing the heavy dependence on imported crude and petroleum products.

The committee will take stock of the technical and commercial aspects of the proposal. One of them is the cost of methanol versus the actual refinery cost of producing petrol/diesel, shorn of subsidies. Industry sources say that the government can make a beginning with petrol. As methanol is cheaper (about Rs. 4.50 a litre) compared to petrol (around Rs. 10), selling the blended product at the existing price will be a profitable proposition. The calorific value of methanol is half that of petrol.

The advantages of methanol include better combustibility and a higher octane rating compared to petrol/diesel, producing upto 20 per cent more horsepower. Methanol emits much less hydrocarbons and noxious gases compared to petrol/diesel. It is also less prone to evaporate and explode in an accident. US President George Bush, as part of his clean air programme, has directed the American automobile industry to start marketing five lakh cars running on gasoline substitutes by 1995. Detroit has been busy developing flexible fuel cars that can run on gasoline or methanol or blends of the two.

The debate in India on methanol as fuel has its roots in a study conducted by Indian Institute of Petroleum, Dehra Dun, which established the technical feasibility of the concept. Following this, Delhi Transport Corporation (DTC) has been successfully running a fleet of buses on 100 per cent methanol as part of an experiment conducted by the Department of Non-Conventional Energy Sources.

The Nayyar panel will also study the toxicity and other negative aspects of methanol. Methanol is highly corrosive and eats through most metals. According to fortune magazine, it is also poisonous. An estimated 14,000 Americans swallow gasoline every year while sucking on a tube to get the siphoning process started.

Methanol has a colourless flame, making it hard to detect. India produces about two lakh tonnes of methanol at present. Six letters of intent have been issued for setting up production facilities with capacities of one lakh tonne each. The gas now flared at Bombay alone can support three to four large methanol plants in western India, according to industry sources.

---

## 'ENERGY METERS' FOR POLLUTION UNITS SOON

High pollution industries throughout the country will soon not only have to install waste disposal equipment but also ensure their actual use. In a novel measure, the ministry of environment proposes to make it mandatory for all such industries to set up "energy meters" to record the amount of power consumed every month by the equipment.

This is being done following a survey by the ministry which revealed tha while companies set up waste disposa facilities to be on the right side of the law, they rarely operate them. Data from the energy metres is expected to help pollution control officials monitor the proper use of the equipment. Assistance from the state electricity boards is to be sought to collect readings from these metres on a regular basis, once they are installed.

According to reliable sources at Bangalore the move is part of a whole series of measures the ministry plans to take to ensure that industries comply with the existing environment protection laws. One of the major problems that has been identified by the ministry is the lack of a proper implementation machinery for controlling pollution even by law offenders.

The sources said that the ministry also plans to take serious steps to curb the widespread dumping of hazardous wastes into the environment. Though a government order in July last year had laid down the maximum permissible limits for disposal of a wide range of identified toxic wastes such pollution continues unabated. This is largely because of lack of any information base with the state pollution control authorities about the type of wastes and the industries guilty of such offences. Among the wastes being let into the environment, totally unchecked are highly hazardous substances like arsenic, cyanides, chromium, mercury lead and chlorinated hydrocarbons. The offending industries include commonly found industries like electroplating, dyeing, leather, pharmaceutical, textile and chemical units. According to the sources another major problem in booking industries, guilty of hazardous waste pollution is that a number of these toxic chemicals are not covered by the existing legislation.

# Chemicals exporters doubtful of target

The growing export of chemicals and allied items will receive a setback unless the crisis in the Gulf is resolved.

The Basic Chemicals, Pharmaceuticals and Cosmetics Export Promotion Council (Chemexcil) has projected the highest ever turnover of Rs. 3,050 crores for 1990-91.

However, the export community is different about achieving this target as global petrochemical prices are firming up and uncertainty looms large on the domestic front. Chemexcil achieved an export turnover of Rs. 2118 crores last year.

Exports of plastic goods and a host of household products are also likely to be hit. The open market price of polypropylene, the fastest growing polymer in India, has touched Rs. 41 a kg. against the Indian producer's official price of Rs. 31.Film grade polypropylene has become scarce in the market. Only PVC has so far escaped the global escalation evident in all other polymers.

Monoethylene glycol (MEG) used in polyester manufacture stood at \$375-390 fob before the Iraqi invasion of Kuwait. The price is sure to firm up in the next few months.

Import of MEG is under OGL. The landed price of imported MEG had dropped substantially during the last quarter of 1989. Prices continued to drop and hit the lowest figure of \$360 a tonne during recent months.

With the global price firming up, local producers are likely to discontinue discounts which they were forced to offer to sell indigenous material.

Indian petrochemical companies like Indian Petrochemicals Corporation Ltd. and National Organic Chemical Industries Ltd. are also concerned about th government's directive to effect a 10 pe cent cut in production as a conservatio measure. This will not only affect th export community, but aggravat domestic shortages, threatening to pus up prices further.

Increased outgo of foreign exchang on petroleum products, combined wit deceleration of exports is bound t worsen the balance of payment position according to industry sources a Bombay. The refineries will be unde pressure to ask for higher prices fo petroleum products in the face of escalating crude prices, according to sources.

It is estimated that for every \$1 increase in the price per barrel of crude oil, the cost of production of diesel goes up by 10 paise.

Approximately 71 per cent of the cost of production of HSD/MS is accounted by crude oil, the raw material.

CIF OFFER FOR YOUR ACTUAL IMPORTS

**1:3 Dichloro Acetone** **C-Acid**
**Meta Hydroxy Benzaldehyde** **2B-Acid**
**2-Amino Thiophenol** **4B-Acid**
**Propiophenone** **Acrylic Acid**
**2-Chloropyridine** **Butyl Acrylate**

TI & M LIMITED

TIM
GPO BOX 1308, BOMBAY -1 PH: 2870903/4, 2870492 TELEX: 11-6378.2216
PO BOX 9151, CALCUTTA-16 PH: 442595-9 TELEX: 21-7359/5187
PO BOX 1960, MADRAS-1 PH: 514261 TELEX: 41-8301
DELHI-17, Community Centre PH: 667177/662004

# Govt. not to interfere in technology pricing

The Union government has declined to interfere in the pricing of technologies developed by government-owned research laboratories.

This is evident from the reply of the science secretary, Council of Scientific and Industrial Research (CSIR) to the All-India Distillers Association (AIDA). AIDA had protested against the decision of National Chemical Laboratory, Pune, to sell the encillium process of continuous fermentation directly to individual distilleries rather than to AIDA.

In his reply, the science secretary said: "The distilleries are profit making commercial organisations and there is no reason why technology should be subsidised and given at nominal cost to them. We are willing to negotiate with your association the terms of licencing the know-how to the association for wider usage but the terms would obviously take into consideration the benefits to be derived by the recipients. In its reply to the science secretary, AIDA said it was working as an extension agency in the matter, to take the benefit of research to the industry and provide impetus to productivity. In these circumstances, the price tag attached to research should not be so high to make it beyond the reach of the association which is a non-profit earning organisation."

NCL, Pune, had developed the encillium process of continuous fermentation and AIDA had been corresponding with NCL on buying the process since June 1987. It had organised a discussion on the NCL process in March 1988.

Following this, NCL had agreed to organise a seminar-cum-demonstration for AIDA members in June 1988, which never took place. "To our consternation, we found from a news item published in The Economic Times on 28.3.90 that NCL has started vending the technology and that two distilleries, one in UP and the other in Maharashtra have already set up a new outfit to accommodate the NCL process", AIDA's letter to CSIR said.

AIDA also approached Mr.M.G.K. Menon, Minister of state for science and technology, with the request that institutes be refrained from behaving like Shylocks in the sale of technology that they develop and that they should keep national interest in view while selling technologies. Institutes will make more money by selling technologies to individual distilleries, but it is doubtful whether there will be a universal adoption of the technology by all distilleries in the country, AIDA said.

AIDA is also keen to buy a new high yielding yeast strain which the Institute of Microbial Technology (IMT) of Chandigarh is said to have developed. Purchase of the new strain by AIDA would have enabled the entire alcohol industry to utilise the same, leading to a quantum leap in alcohol production. The department of biotechnology has, however, demanded a lump sum payment of Rs. two lakhs from each distillery/brewery/factory using the strain and, in addition, a royalty of two paise per litre of alcohol produced by the improved strain.

There are some 200 distilleries in the country producing about 800 million litres of alcohol, a year, which is expected to go up to 1000 million litres this year. If all distilleries elect to use the strain developed by IMT, the net lump sum accrual to the institute will amount to Rs. four crores and royalty will amount to Rs. two crores a year.

## PIG IRON PAUCITY HITS FOUNDRIES IN COIMBATORE

The foundry industry in Coimbatore is in doldrums with over 450 units not having been supplied pig iron from July by the Steel Authority of India.

The Coimbatore District Small Industries Association and the Coimbato
Small Foundrymen Association hav
stated that the stockyard of SAIL
Coimbatore and that of Vizag steel pla
at Bangalore are dry.

As production has come to a grin
ing halt, many foundries have down
their shutters throwing out of emplo
ment several hundred workers and ma
foundries have resorted to lay off.

The President of Codissia, in a sta
ment, has lamented that SAIL was iss
ing only 25 per cent of the requiremen
of pig iron to foundries for the last se
eral years. Even this meagre quanti
has been denied from July.

He has also pointed out that sma
engineering industries have not bee
supplied items like steel sheets, ste
plates, rods affecting their productio
adversely.

## SYMPOSIUM ON PROCESSING OF COAL

The United States Department
Energy/Pittsburgh Energy Technolo
Center (DOE/PETC) and the Elect
Power Research Institute (EPRI) a
cosponsoring The Second Internation
Symposium on the Biological Proce
sing of Coal to be held at the Hy
Islandia in San Diego, California (US
on May 1-3, 1991.

Articles of 300-400 words
research on following topics are soug
for: Coal structure and bioreactivit
coal analysis; coal biosolubilizati
biogasification and biobeneficiati
(including deashing, desulfurizati
denitrification, and bio-assisted flo
tion); and bioconversion of coal-deriv
substances (including bio-conversion
synthesis gas and coal combusti
gases, and bioprocessing of tars a
sludges). Send synopsis and direct a
inquiries to: Stan B. Yunker, Generat
and Storage Division, Electric Pov
Research Institute, Palo Alto,
94304, (415) 855-2815.

# Dalmias also in fray for Assam cracker project

Close on the heels of the Khaitans, the Dalmias too have expressed their willingness, to be one of the co-promoters in the Rs. 2,300 crore Assam Gas Cracker Project.

Assam industries minister Gunin Hazarika told The Economic Times that Mr. Mr. Sanjoy Dalmia, has formally put forth his proposal to this effect. The minister said the Thapar house is also making enquiries in Delhi and that Vam Organic of the Bhartiyas has been in touch with the Assam Industrial Development Corporation (AIDC) for quite some time. Mr. Darbari Seth of Tata Tea too is reported to have written to the Assam chief minister about the proposed project, but the industries minister is not fully aware about his proposal as yet.

Mr. Hazarika said that though prospective co-promoters are lining up, the letter of intent for the gas cracker project has not been issued yet by the Centre. On August 20, a meet will be held to discuss matters relating to product range, finance and co-promoters with the Union ministry of petroleum and chemicals and the letter of intent is likely to be issued to AIDC. Assam industries secretary O.P. Agarwal, the managing director of AIDC and the general manager of the oil division of AIDC will attend the meeting. Mr.Hazarika said that after receipt of the letter of intent, more business and industrial houses are likely to be willing to participate in the joint sector project. It is believed that the Khaitans, because of their more than one hundred year old association with Assam's economy in connection with their tea interests, will have an edge over the others.

## ROHM & HASS TO DISINVEST STAKE IN MODIPON

Rohm & Hass Company, USA, a 37.20 per cent shareholder in Modipon Ltd., has decided to disinvest its stake through the public issue route. According to sources, the company has obtained the necessary permission for disinvestment and is now awaiting approval from the controller of capital issues for a public issue which may be the region of Rs. 24 crores.

Rohm & Hass is understood to have taken a decision to disinvest its stake as far back as 1987. However, the US company choose to give the Modis an opportunity to find another collaborator to take up the equity. Rohm & Hass collaboration in India is mainly with with Indofil, the chemicals division of Modipon. However, internationally, the US company is moving out of speciality chemicals. Hence the decision to disinvest. According to the latest share distribution figures submitted to the Bombay Stock Exchange (BSE), Rohm & Hass holds 37.20 per cent of th equity, and government companie —the other major shareholders — ow around 25 per cent. Over 28 per cent o the equity is held by other bodies co porate, while the directors and their re atives hold 6.18 per cent leaving hardl any with the general public.

The disinvestment of a large chun of 37 per cent will result in a tremem dous jump in liquidity of the scrip, par ticularly at a time when the company i doing exceedingly well in the fibre division. According to sources, ther was a request for the disinvestment t be done through a rights issue as in cas of Hindalco. However, this was turne down by the government. There wa also some talk about parking the share with a leading foreign bank to buy time for seeking a new collaborator. However the difficulty in finding a collaborator with interests in chemicals as well as fibres led to the plan falling through.

FOR MOST COMPETITIVE CIF OFFERS FOR:

**Barium Carbonate**
**Barium Chloride**
**Sodium Hydrosulphite**
**and other Chemicals**

Please Contact:

**M/s. K. SANGHVI & CO.**

308, 'Gulab' 3rd Floor,
237, P.D 'Mello Road,
Bombay 400 001.

Phone: Office: 2612232/2610711 Resi: 8128473/8226451
Telegram: KEYSANGHVI Telex: 11-73516 KSC IN
Fax No.: (22) 2618970

### HALDIA PETROCHEMICAL COMPLEX

# IDBI not to ease lending norms

The Industrial Development Bank of India (IDBI) has no immediate plans to relax its existing lending norms to participate in the financing of the Rs. 3,000 crores Haldia Petrochemical complex.

The existing norm presupposes that, without the approval of its own board and clearance from the finance ministry, IDBI's direct lending in any single project should not exceed 25 per cent of its net worth. IDBI's present net worth is estimated at Rs. 1,600 crores and every year a sum of about Rs. 100 crores or so is added to its reserves.

The question of relaxing the lending norm arises in the context of the massive size of the Haldia petrochemical project, both physically and financially. The Rs. 3000 crore project will have a debt-equity ratio of 3:1. That is to say, the share capital will be of the order of Rs. 750 crores and the size of loan, Rs. 2250 crores, including a foreign exchange component of Rs. 650 crores.

"Apart from involving major financial institutions and banks, we are also examining various other ways and means including floating new instruments like convertible debentures, conversion of part of the foreign loan into equity and taking recourse of mutual funds which are flush with funds to mop up resources for the projects", said Mr. S.B. Nadkarni, chairman of IDBI, at Calcutta on Aug. 18th, indicating that it might take at best six months to finalise the financial package for the project.

Earlier in the day, Mr. Nadkarni formally received from the West Bengal finance minister, Dr. Asim Dasgupta, the loan application for the project. The share capital is to be subscribed in the proportions of 26 per cent by West Bengal Industrial Development Corporation (Rs. 195 crores), just under 25 per cent by the Tatas (Rs. 188 crores) and the balance 49 per cent by the public (Rs. 367 crores). The loan amount, which is to attract the usual dual interest rates of 14 per cent and 15 per cent for construction and post-construction periods respectively, will be provided in tranches. He also called on the chief minister, Mr. Jyoti Basu.

The IDBI chairman does not apprehend any major cost escalation of the project provided everything goes as per schedule. "We are still going by the estimate of Rs. 3,000 crores", he said adding "some built-in cushion against cost escalation has already been provided in the project estimate". He however, felt that the promoters had to be very particular about the strict adherence to schedules.

Asked about the probable impact of exchange rate fluctuations on the project, he replied "we have to face the consequences". However, the size of the foreign exchange component being not very large, the impact of the fluctuations might not be too hard. The coverage provided by the Exchange Risk Administration Scheme (ERAS) would protect to the extent of only 60 million, he added.

Mr. Nadkarni indicated that an additional 600 acres of land might be required for the project. The mother cracker plant alone, it is felt, will occupy the bulk of about 1000 acres of land already acquired. Dr. G. Goswami, general manager of IDBI and also a director of Haldia Petrochemicals Limited, gave the details of the project capacity as contained in the letter of intent. The cracker plant will have a capacity of 300,000 tonnes of ethylene.

The intermediate products to be produced from ethylene will include propylene-150,000 tonnes, butadiene-53,000 tonnes, benzene-66,000 tonnes and acetylene gas-5,380 tonnes.

## NATIONAL CONFERENCE ON SYNTHETIC MEMBRANES

A two-day National Conference on 'Synthetic Membranes and their Applications' will be organised by the Central Salt & Marine Chemicals Research Institute, Bhavnagar during 29-30 November, 1991 at Bhavnagar. The topics that will find place in this conference are development of polymers for use as membranes, membrane characterisation, applications and membrane in water and effluent treatment, separation, concentration and purification processes in chemical industry and biotechnology, use of non-conventional energy sources and energy recovery systems, field experience on membrane based desalination plants set up in rural and urban areas etc. Although the conference is on National level, the forieign participation is welcome. For more details interested participants are invited to correspond with Dr. A.V. Rao, organising secretary, National Conference on Synthetic Membrane and their Applications, Central Salt & Marine Chemicals Research Institute, Gijubhai Badheka Marg, Bhavnagar-364 002. Gram: Namak, Telex: 0182-230 ABC SALTIN, Phone-24562.

## ECOLOGY NOD FOR 2 ATOMI UNITS

The Centre has given environme clearance to the two new atomic pow plants of 500 mw capacity each at Ta apur in Maharashtra's Thane Distric Dr. P.K. Iyengar, Chairman of t Atomic Energy Commission said Bombay. In an informal talk wi newsmen at the Bhabha Atom Research Centre at Bombay Dr. Iye gar said work would start on these tv plants soon. Mr. S.L. Kati, Managi Director of the Nuclear Power Corp ration India Ltd. said both t units would be commissioned 1997-98.

SC

# Star Chemicals

## FOR YOUR IMPORT REQUIREMENTS OF

- N-Acetyl Sulphanilyl Chloride
- DL-Methionine Feed Grade
- L-Lysine Mono HCl Feed Grade
- L-Lysine Mono HCl Pharma Grade
- Aniline Oil
- Methyl Aceto Acetate
- Sodium Nitrite
- Sodium Boro Hydride
- Ethyl Cyano Acetate
- Methyl Cyano Acetate
- 2,4 Xylidine
- 2,6 Xylidine
- Para Nitro Chloro Benzene
- Acetic Anhydride
- Phenol USP
- Epichlorohydrine
- Propylene Glycol USP and Technical Grade

**And for other Chemicals, Pharmaceuticals & Intermediates**

PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

MADRAS OFFICE:
D-4, 2/36 RAMS SQUARE
2, Village Road
MADRAS 600 034
**Tel: 864430/8250097**
**Tlx: 041 25164 STAR IN**
**FAX: 044 473762**

HYDERABAD OFFICE:
'NALANDA' Unit No. 7
6-3-649, Somajiguda
Hyderabad 500 482
Tel: 210288
**TLX: 0425-6131 STAR IN**

**OUR LOCATION DOES NOT MAKE ANY DIFFERENCE TO OUR COMMITMENT TO SERVE YOU**

MANUFACTURERS &
REPRESENTATIVE OF
INORGANIC AGRO CHEMICALS

* MANUFACTURE:

1. AMMONIUM NITRATE
2. POTASSIUM NITRATE
3. COCONUT SALT (Fert. use)

FOR MOST COMPETITIVE CIF
PRICE, PROMPT & REGULAR
DIRECT IMPORT FROM
USA/JAPAN/GERMANY/
CHINA/SPAIN/FRANCE

* STOCKISTS OF:

1. AMMONIUM BI-CARBONATE
2. BARIUM NITRATE
3. CAUSTIC SODA FLAKES/LYE
4. COPPER;SULPHATE
5. FERROUS SULPHATE
6. HYDRO
7. LITHARGE
8. METHANOL
9. METHYL AMINE
10. NITRIC ACID
11. PHENOL
12. SULPHURIC ACID
13. SODA ASH
14. SODIUM SULPHATE
15. SODIUM SULPHIDE
16. SODIUM NITRATE
17. T.G. UREA
18. TITANIUM DIOXIDE
19. TOLUENE
20. TRISODIUM PHOSPHATE
21. ZINC CHLORIDE
22. ZINC OXIXE

**THAKKER CHEMICALS**
**& FERTILIZERS PVT. LTD.**

* **Registered Office:**
307, 'NAVJIVAN', 3rd Floor,
121/127, Kazi Sayed Street,
Bombay - 400 003.
**Tel. No. 336261/322719**
**Telex No. 11-75599 TCF IN**

* **Factory:**
Plot No. 1712, GIDC IIIrd Phase,
P.O. VAPI, (GUJ). 396 195
**Tel. No. Fact: 866 / Resi: 668.**

FOR YOUR REGULAR REQUIREMENTS OF

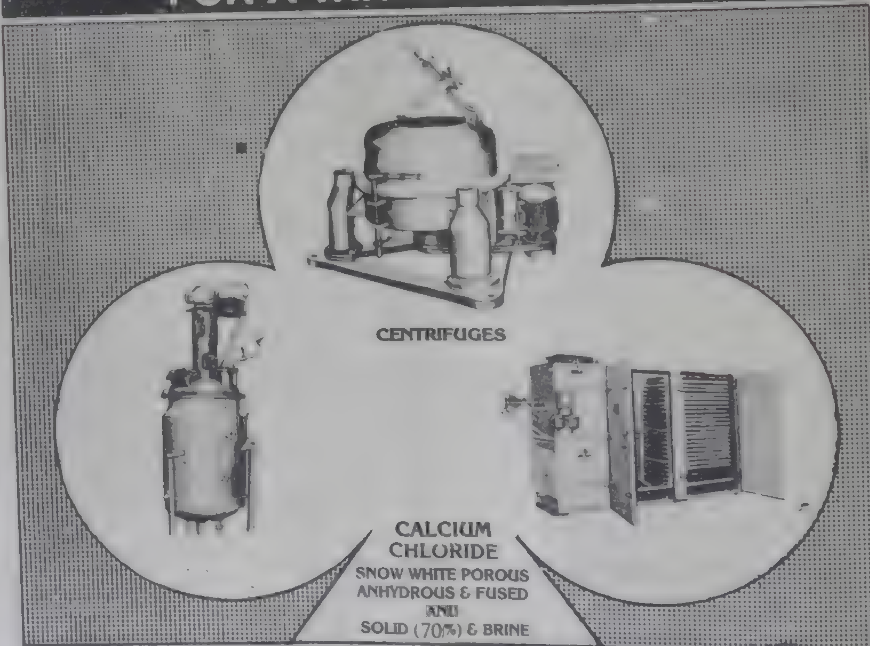
**WHITE BEESWAX**
**YELLOW BEESWAX &**
**HONEY**

*PLEASE CONTACT MANUFACTURER :*

**MEHSONS CHEMICALS PVT. LTD.,**

P.O.B. No. 121
KAMLA BHAWAN, MADARI GATE,
BAREILLY 243 001 ( U. P. )
PHONES : 76517, 77359, 74150, 76526
TELEX : 0577 209 ME IN
CABLE : VEGLAMUKHI - BAREILLY

**FOR A WINNING DEAL OF**



CENTRIFUGES

CALCIUM
CHLORIDE
SNOW WHITE POROUS
ANHYDROUS & FUSED
AND
SOLID (70%) & BRINE

**ACE INDUSTRIES**

Adm. Office
GALA NO. 14, ALPINE IND. ESTATE
MAROL MILITARY ROAD, ANDHERI (EAST)
BOMBAY - 400 059. PH. OFF.: 6365763
GRAM: MAKCHEMICS-Andheri (West) RESI: 6212378
Factory: J-718/2, G.I.D.C., 40 Shed, VAPI, Dist. Bulsar. Phone: 1494

# A rapid wrap-up of what's new in operations, Processes and Products

### Our Chemical Industry (CI) in 2001

Sir Geoffrey Allen in his Leverhume Lecture (*Chem. Ind.*, 1990, No. 11, 4 June, p. 349-353) has projected a rosy picture of the CI, which is international, highly competitive and one of the world's most successful industries. CI is crucial for the well being of the society. Success will rely on good management and good people. Du Pont's motto "Better things for better living" after its monumental success of Nylon 66 was later tempered by lacklustre performance of the synthetic leather Corfam. More than twenty companies in the world have a turnover in excess of £4 billion. R&D expenditure varies between 2.5 to 10.5% of the sales depending on whether a company produces bulk chemicals or speciality chemicals.

The concern for environment should drive us to treat it as an opportunity to devise better products and to design processes which utilise feedstocks more efficiently.

### Amorphous metal (AM) transformers

Rosenfelder has given a very useful account of AM transformers, whose development was triggered by the oil crisis of mid-70's. The discovery of AM was in 1959 (USA & USSR simultaneously). By rapid quenching thin foils, materials with non-crystalline structure with no grain bundaries can be produced. A typical AM alloy is 93% Fe, 5% Si and 3% B. Allied-Signal in USA has been consistently active. The AM may allow saving of 70% in the core loss of a transformer -- which occurs while current is flowing through the primary winding even when no current is being drawn from the secondary. By turn of this century a production of 100,000 tpa may well be possible. (*Chem. Ind.*, 1990, No. 11, 4 June, 345).

### Methyl methacrylate (MMA) from acetone: recycle of HCN

Mitsubishi Gas has claimed that acetone cyanohydrin can be hydrated to the corresponding amide which in turn can be reacted with methanol and CO at 200 atm to give $(CH_3)_2$ (COH)COOMe and this on dehydration gives MMA. (USP 4,613,684, Sep. 1989, *Chemtech.* 1990, July, p. 425).

### Oxidation of ammonia to nitric oxide: Redistribution of Pt metals

Fierro et al have discussed relevant aspects of loss of Pt (and even Rh) from gauze catalyst and Pd from the "getter" alloy gauzes. An experimental study in a high pressure (~8 to 9 atm) plant is reported. Formation of Pt powder, weakly held on the Pt-Rh alloys, occurs due to in-depth degradation of the Pt-Rh gauzes and similarly Pd powder is formed on Pd-Cu catchment gauzes. Morphological aspects of the powders were studied. The composition of noble metals in the catchment gauzes, powders recovered from the glass wool filter and heat exchangers was determined. (*Plat. Metals Rev.* 1990, **34**, 62-70).

Farrauto and Lee (of Engelh Corpn. USA) have given a very useful account of a new Pt-Rh gauze catalyst 'Hylite' which gives higher activity in a much shorter period after start-up. As is well known, the gauzes experience in the first few days a marked increase in the surface area (even a factor of 200). (This phenomenon is referred to as "sprouting"). High surface area coatings were produced by depositing Pt salts onto the surface of a Pt alloy gauze from aqueous or non-aqueous solutions. Commercial experiments are reported. A 33% improvement has been observed. (*Ind. Eng. Chem. Res.* 1990, **29**, 1125).

### Pt Metal complexes as homogeneous catalysts: Water soluble catalysts

Homogeneous catalysts are very prominent in oxo-reaction, carbonylation, asymmetric hydrogenations, etc. Rhone-Poulenc-Rurhchemie have a water soluble version for the oxo-reaction (hydroformylation) where a two-phase system is adopted in industrial practice to facilitate catalyst recovery. Water solubility is imparted by using sulphonated derivative of triphenyl phosphine ligand. Now Pringle and Smith have shown that tri(hydroxymethyl) phosphine (THMP) which is conveniently obtained by reaction between phosphine and aq. HCHO (incidentally catalysed by the Pd/Pt/Ni complex of THMP) should prove to be useful and their work brings about the utility. (*Plat. Metals Rev.*, 1990, **34**, 74).

### Oxidative dehydrogenation of ethane/propane/butane

B.P. has claimed that a Pt group metal catalyst supported on a monolith works well for oxidative dehydrogenation of ethane to ethylene. (E.P. Appln. 332,289A; *Plat. Metals. Rev.* 1990, **34**, p. 114).

### Oxidation of polyoxyethylene alkyl ethers

Oxidation can be conducted in an aqueous solution at

30-90°C with granular Pt-Pd/C catalyst to alkyl ether acetic acid which is useful as a surfactant, modifier of functional polymers, etc. (Jpn. Pat. 1/149,752, *Plat. Metals Rev.* 1990, **34,** p. 115).

### Orimulsion — A new world fuel

In Venezuela a new fuel, bitumen-water emulsion has been suggested as an economic outlet by the world's bitumen deposits. One of the first users of the fuel in the U.K. could be Power Gen. B.P. has collaborated with Intersep SA and a two-stage process is used to produce the desired product. In the first stage, a commercially available surfactant is used to produce polyhedral oil drops separated by an aqueous solution. In the second stage an emulsion with oil droplet size of about 18 microns is produced. (*Chem. Engr.* 1990, No. 472, 26 April, p. 12).

### A composite construction material

A. Moriyoshi **et al** have come out with a new class of material, called Aquaphalt, which solidifies in water and has other desired properties for civil engineering work. Here an asphalt emulsion, cement and a water absorbing polymer is used. On mixing these components form a gel instantly. The hardened material has low water permeability, high ductility and good adhesion to other materials. (*Nature*, 1990, **34,** 4, 15 March, p. 230).

### Methyl tert butyl ether (MTBE)

A USSR Patent claims that it is better to go via the ether of isobutylene/isoamylene with ethylene glycol or with ethyl cellulose or ethyl carbitol and subsequent exchange with methanol. Ion exchange resin catalysts are used for both steps. (*Chem. Abstr.*, 1990, **112,** 197623 and 197624).

### Separation of *alpha* and *beta* alkyl naphthalene isomers

The *alpha* isomer can be separated from *beta* by selective bromination of the *beta* isomer, followed by distillation. (Jap. Pat. 01,212,532, Oct. 1989, *Chem. Absir.* F. 190, **112,** 197885).

### Methyl formate

A novel synthesis has been claimed where methanol, $H_2O_2$ and $O_2$ or air is irradiated at 25°C. (Jap. Pat. 01,316,345, Dec. 1989; *Chem. Abstr.* 1990, **112,** 197643).

### Fluoropolymers (FP)

Brady has given a very readable overview of this subject. As is well known, polytetrafluoroethylene (PTFE, TEFLON) was discovered more than 50 years ago and has the unique distinction of a material with a wide range of interesting properties and having a negligible frictional resistance. After Teflon a number of other FP have been used in such sophisticated applications as artificial joints, blood vessels etc. apart from use in fabrics to render them resistant to oil, water and stains; electrical insulation; lenses and optical fibres; bearings, valves, gaskets; etc. In 1987, the total world production of fluoropolymers was 54,000 tonnes. This review covers thermoplastics as well as thermosetting FP.

Fluoropolymers with reactive groups at the ends of the molecule will copolymerise with other monomers and bond permanently to a surface. (*Chem. Brit.* 1990, **26,** May, 427-430).

### Mixing of solid powders with "Static mixers" (Motionless mixers)

A considerable amount of work in this area has been done in this area by Gyenis and co-workers in Hungary. They have demonstrated that powders can be mixed very well with these mixers. The mechanism of flow of powders with and without static mixers is entirely different. (*Powder Handling and Processing*, 1989, **1,** No. 3 and No. 4, p. 247; 365 also No. 2, p. 165).

### Purification of anethole

It has been claimed that recrystallization from aqueous emulsion gives a good product. K soap of tall oil fatty acid is a good emulsifier. (Ger. Offen. 3,925,914, Feb. 1990; *Chem. Abstr.* 1990, **113,** 23356).

### Ibuprofen

Nippon Petrochem have claimed that selective alkylation of toluene to p-ethyl toluene can be followed by side-chain alkylation of $CH_3$ with $C_3H_6$ to give *p*- isobutyl ethyl benzene which in turn on dehydrogenation gives *p*-isobutyl styrene (IBS). IBS on carboxylation with CO + $H_2$ gives -CHO which on oxidation gives Ibuprofen. (E.P. Appln. 347,939, Dec. 1989, *Chem. Abstr.*, 1990, **113,** 23374).

### Permeation of ethylene/propylene through *Nafions*

Kanno et al have shown that *Nafions* ion exchanged with $Ag^+$ permit 2 to 3 time increase in the rate of permeation of ethylene or propylene. (*J. Chem. Soc. Chem. Commun.* 1989, No. 23, 1854).

### Aerobic wastewater treatment: Use of hollow fiber membranes

Res. Inst. Polymers and Textiles (Japan) have shown that a proprietory fibrous material wrapped around the outside of hollow fibre membrane (based on silicone), upon which aerobic microorganisms are immobilised and where air flows inside the hollow fiber gives enhanced rates of $O_2$ transfer. (*Chem. Eng.*, 1990, **97**, No. 6 (June), p. 17).

### Polyols from sucrose

BASF have claimed that aqueous 50% sucrose solution can be subjected to hydrogenolysis at 250°C and 180 atm. in the presence of Co-Cu-Mn-Mo catalyst to give a mixture of propylene glycol, ethylene glycol, $EtCH(OH)CH_2OH$, etc. (E.P. Appl. EP 344,561 Dec. 1989; *Chem. Abstr.* 1990, **113**, 5696).

### Selective dehydrogenation of 1,2 alkanediols

Henkel have claimed that Cu catalyst at 180-280° allows selective dehydrogenation to hydroxyketones. (Ger. Offen. 3,823,458, Jan. 1990; *Chem. Abstr.* 1990, **113**, p. 5713).

### Organic sonochemistry

Luche **et al** and Einhorn **et al** have proposed a rational mechanism and it appears that the rate enhancement or selectivity variation atleast in part, is influenced if radical intermediates are encountered. Some examples are given. (*Tetra. Lett.* 1990, **29**, 4125-4128; 4129-4130).

### Ceramic Processing (CP)

R.W. Rice (of W.R. Grace, U.S.A.) has published a state-of-the-art review of CP — an area which has acquired a lot of importance due to engineering ceramics, Randome (missile nose tip), high voltage insulators, ceramic fabrics, etc. The emphasis is on powder-based methods which consist of preparation, modification and handling to sintering or pressure densification (or post-densification). Non-powder based methods, such as chemical vapour deposition, melt, and polymer pyrolysis processing are also presented. Processing of ceramic composites is reviewed. (*A.I.Ch. E. Jl.* 1990, **36**, 481-510).

### Selective hydroxymethylation of phenol: Use of cyclodextrins (CD)

Komiyama has reported that hydroxypropyl CD can be used to change the regioselectivity in favour of the *para*-product. The rate of formation of the *para* product could be as high as 6 times that of the ortho product. (*J.C.S. Perkin Trans.* 1989, p. 2031).

### Oxidation of benzyl alcohol with sodium hypochlorite: PTC

Do and Chou have shown that oxidation of benzyl alcohol is catalysed by tetrabutyl ammonium chloride; dichloroethane was used as a solvent. A kinetic study has been made for this reaction which occurs in the organic phase. (*Ind. Eng. Chem. Res.*, 1990, **29**, 1095).

### Reaction between benzyl (or *p*-chlorobenzyl) chloride (BC or PCBC) with sodium sulphide: Role of omega phase

Pradhan and Sharma have showed that in this solid-liquid reaction PTC can catalyse the reaction greatly. It is even more interesting to find that a small amount of water which forms an additional phase occupying a small volume, referred to as the omega phase, can change the rate of reaction radically and enhancement factors of 12 and 57 were realised for BC and PCBC respectively. (*Ind. Eng. Chem. Res.* 1990, **29**, 1103).

### Aromatic nitration using azeotropic acid

Belson has investigated the use of azeotropic composition of nitric acid-water for the nitration of chlorobenene in a distillation method. In the continuous method water is removed azeotropically and yields of nitrochlorobenzenes in excess of 80% of theoretical are realised. This method obviates the use of sulphuric acid. (*Ind. Eng. Chem. Res.* 1990, **29**, 1562).

### Absorption of $NO_x$ in aqueous alkaline solutions: Selective manufacture of nitrite

Suchak **et al** have proposed a model which delineates conditions that allows highly selective formation of sodium nitrite and have checked results in a pilot 150 mm i.d. 3 m high packed column. The temperature was varied from 50 to 90°C. Both the temperature and gas phase mass transfer coefficient influence the selectivity which can approach even +98%. (*Ind. Eng. Chem. Res.* 1990, **29**, 1492).

### Sectionalised Bubble Columns (SBC): Backmixing in liquid and solid phases

Joshi and co-workers have proposed sound models for backmixing in gas-liquid and three phase sparged reactors. Now by an elegant analysis, the extent of backmixing in SBC has been studied and checked with experiments in a 40 cm i.d. bubble column containing radial baffles. Radioactive Technetium-99 metastable was used as a tracer and 198 Au for the solid phase. The radial baffle design features have been recommended. The dia. should be 0.71 times column dia. The angle of radial baffles for smooth flow of solid flow has been recommended. (*Ind. Eng. Chem. Res.* 1990, **29**, 1503).

### Microemulsions (ME)

ME are thermodynamically stable emulsions of hydrocarbons and water (This subject has been covered in this column several times). Both detergent based and detergentless ME are known and many aspects of thermodynamics have been studied. Robinson has given a succinct account of this subject. The ME droplet can be effectively considered as a "Microreactor", because reactions will take place in the very limited size domain provided by the droplet. ME might then provide a steric constraint by acting as a template which limited the growth for particle or polymer formation. Enzyme catalysed reactions also stand to benefit with ME.

An area of interest seems to be the study of droplet dispersions in low density media such as near supercritical fluid and supercritical fluids -- which offer novel synthetic possibilities and the opportunity for the further refinement of separation methods. (*Chem. Brit.* 1990, **26**, No. 4, 342).

### Electrochemical reduction of CO/$CO_2$ in hydrogen plants

Ogura **et al** have shown that CO and $CO_2$ can be reduced in methanol, at room temperature and atm. pressure, to methanol via homogeneous catalysis using 1-nitroso-2-naphthol, 3,6-disulphonatocobalt. (*Chem. Ind.* 1990, 2nd July (No. 13), p. 438).

### Asymmetric hydrogenation (AH) of amino ketone derivatives

Takahashi **et al** have reported an unprecedented and highly efficient AH of the 3-(aryloxy)-2-oxo-1-propylamine derivatives; leading to the practical synthesis of e.g. (S)-propanolol hydrochloride. RH [1,5 cyclooctadiene)Cl]$_2$ and [2S,4S]-MCCPM is used as a catalyst. (*J. Amer. Chem. Soc.* 1990, **112**, 5876).

### Chiral Drugs (CD)

There is now an increasing interest, which will probably turn into a requirement by statutory bodies, in making available CD rather than racemates where the other isomer may be described as "medicinal pollutant" or "isomeric ballast". It is necessary to track the behaviour of racemates in humans. In this 'cascade of inadequacy' chemists are the only scientists aware of the problems of steroisomers at the early stages of drug development. It may be noted that for some agrochemicals, such as mecoprop, dichloroprop, Swiss, Japanese and Dutch authorities are insisting on the active R-isomers rather than racemates.

Sharpless epoxidation is being used to make optically active glycidol from alkyl alcohol. Asymmetric dihydroxylation of *cis* olefins is also practiced. Chiral epoxidation of a saturated vinyl ketone has also been covered properly. (*Chem. Ind.*, 1990, No. 13, 2nd July, p. 418).

### $NO_x$ removal: Electrochemical reduction of ferric to ferrous chelates

Dow has come up with an electrochemical route, where anodes and cathode compartments are separated by a membrane, which removes a major drawback of the $NO_x$ removal processes where ferrous chelates are used and due to oxygen in the flue gas ferrous is oxidised to inactive ferric, which allows ferric to be converted to ferrous. (*Chem. Eng.*, 1990, **97**, No. 7 (July), p. 17).

### Solvent Extraction in emulsion phase contactor (EPC)

Oak Rigdge Nat. Lab. (USA) has developed an EPC where water containing the solute is passed through a nozzle between two electrodes and a pulsed electrical field shatters the water particles into very tiny droplets, which are propelled by the field, gravity or both through a solvent. (*ibid*, p. 19).

### Removal of nitrogen from natural gas

Bend Res. Inc. (USA) has claimed an absorbent which is an organometallic complex with a high affinity for nitrogen and negligible for methane which allows selective removal of nitrogen at extremely low cost. (*ibid*, p. 21).

### Plastic oil rig

Offshore production of oil is now gaining a lot of importance. Depths of 1000 m have been covered and it is expected that by the turn of the century we may well have to go to depths of 1800 m. The engineering problems will be severe as the design of 1800 m riser pipe will be demanding. On modern platforms three prime targets for weight reduction are: wt. reduction of risers; the 23 or 30 cm dia pipe which brings oil from the sea bed to the surface; tendon for tension leg platforms; and mooring cables for floating platforms. Carbon fibre reinforced plastic as a material of construction is attracting attention and in some cases, where corrosion is not serious, polyaramid fibres (e.g. Kevlar) reinforced plastics are being considered. (*Chem. Brit.* 1990, **26**, 528).

For **IMPORT** of Intermediates
OF FOLLOWING BULK DRUGS/AGROCHEMICALS
FROM OUR OVERSEAS PRINCIPALS, PLEASE CONTACT US

**Acyclovir**
**Amoxycillin**
**Ampicillin**
**Astemizol**
**Atenolol**
**BPMC**
**Buspirone**
**Captopril**
**Cephaloglycine**
**Cefapirine**
**Ciprofloxacine**
**Diltiazem**
**Desferioxamine**
**Famotidine**
**Flenoxazine**
**Flumequine**
**Ftorafur**
**Glipizid**
**Haloperidol**
**Indapine**
**Ketoconazol**
**Loperamide**
**Mecllinam**
**Nifedipine**
**Norfloxacine**
**Omeprazol**
**Pefloxacin**
**Pivampicillin**
**Pyrazine-2-3-Di-Carboxylic Acid**
**Sulforidazine**
**Terbutaline**
**Terfenadine**
**Trifluperazine**
**Triflupromazine**
**Trifluridine**

**Phenylephrine HCl**
**and also for import of**

**N,N-Bis-Trimethyl Silylurea &**
**N-Trimethylsilyl Imidazole**
**(Silytating Agents)**

PACIFIC

Please Contact the Indenting Agent:

**M/s. PACIFIC AGENCIES**

41, Prospect Chambers Annexe, 3rd Floor, 317, Dr. D.N. Road, Bombay 400 001.
**Telephone: Office: 2044482/244923/232833**
**Residence: Mr. Lathi 5113387 Mr. Vyas 5121909**
**Telex: 011-86799 PCFC IN**

**Unichema International**

(UNILEVER GROUP)
West Germany/Holland/U.K./Australia/Malaysia
OFFERS:

for **COSMETICS INDUSTRY**
n-Butyl Stearate
Glycerol Mono Stearate
Isopropyl Myristate
Isopropyl Palmitate
Propylene Glycol Dicaprylate
Glycerol Tricaprylate
Stearic Acid

for **PERFUMERY INDUSTRY**
Glycerol Triacetate
Glycerol Diacetate
Diethyl Phthalate
Isopropyl Myristate

for **FOUNDRY MOULDS & CORES**
Ethylene Glycol Diacetate
Glycerol Triacetate
Glycerol Diacetate
Glycerol Mono-Oleate

For imports into India and further details
Please Contact:
SOLE AGENTS IN INDIA

se

soofi enterprises

1317, Dalamal Tower, 211, Nariman Point
Bombay 400 021.
Tel. Nos.: 2043044/233074
Tlx. No.: 0118-4187 SUFI IN
Cable: SOOFICHEM
Fax No.: 2047657

We also offer:
ORANGE OIL (Sweet Cold Pressed USP)
D-LIMONENE (Natural)
GUM ROSIN (WW & WG Grades)

---

INDIAN ORGANIC
CHEMICALS LIMITED

LEADERS IN THE FIELD OF
INDUSTRIAL CHEMICALS

*NOW AVAILABLE*
HIGH QUALITY

**GLYOXAL 40%**

For Pharmaceutical and Textile
Auxiliary Manufacturers

ooo

OUR RANGE OF PRODUCTS

**Acid Group**
- Acetic Acid
- Acetic Anhydride
- Acetaldehyde

**Benzyl Products**
- Benzaldehyde
- Benzyl Acetate
- Benzyl Alcohol
- Benzyl Chloride

**Ester Solvents**
- Ethyl Acetate

**Plasticizers**
- DOP (Di-2-Ethyl Hexyl Phthalate)
- DBP (Di Butyl Phthalate)
- BBP (Benzyl Butyl Phthalate)
- DEP (Di Ethyl Phthalate)
- Other Phthalates

Manufactured by

**INDIAN ORGANIC
CHEMICALS LIMITED**

Mehta Mahal, 15, Mathew Road,
BOMBAY - 400 004.
Gram: 'FUTURA' Bombay
Tel: 8111428-8112529-8113420
Telex: 011 - 75147 IOCL IN

### THEOPHYLLINE SUPPLY

## Chinese 'dumping' hits local units

Indiscriminate imports of theophylline (an anti-asthmatic bulk drug) at "dumping" prices from China is eroding the viability of indigenous producers for the second time in five years.

Indigenous manufacture of theophylline began in 1983-84. The installed capacity of the three units was more than adequate to meet the country's needs and the price was competitive vis-a-vis imports from West Germany.

Hardly had indigenous production stabilised, when Chinese material started coming in at very low prices. This forced two of the three infant units to close down. The third survived, incurring huge losses.

After the Indian theophylline units were crippled, the price of the Chinese material gradually increased to more than double by 1987, according to industry sources. Supplies were also undependable and there were shortages in the Indian market lasting almost a year. This led to inadequate availability of speciality formulations required for the management of asthma.

In 1989, indigenous production was revived and the industry was able to compete with supplies from both China as well as West Germany. The number of indigenous manufacturers also increased from three to six, and the installed capacity rose to about 400 tonnes against the country's demand for 250 tonnes. New Chinese prices now threaten to put the clock back, sources said.

The cif price of theophylline, which stood at $14.75 a kg. only a year ago, is now quoted at $7.8 a kg. It is noteworthy that there is no significant reduction in the cif price of the German material. "So one is left to wonder whether China exports the drug at a realistic price or is selling at artificially low prices with the ulterior motive of killing the Indian industry," according to one producer. "When the foreign exchange position of the country is precarious, the government's apathy in taking prompt action is puzzling," he said.

Producers claim that far from receiving any help or protection from the government, they are accused of overcharging on comparison with 'arbitrary and unrealistic' prices fixed by the government on the basis of 'outdated' cost data.

---

### MOST DRUG SSIs MAY ESCAPE CONTROLS NET

The Department of Chemicals and Petrochemicals is formulating a policy which will keep a majority of the small-scale pharmaceutical companies out of the purview of the Drug Price Control Order (DPCO).

Until now, all SSI pharmaceutical companies were free of price control. But when the government first started thinking of bringing small-scale units which have achieved a turnover above a certain level within the purview of the DPCO, the industry feared that the government would set a low cut-off level of Rs. 1 crore and impose price controls on a large number of units.

However, it is now learnt that the department is planning to bring only those SSI units within the DPCO which have links with the DGTD-registered units and MNCs. These firms are loan licencees of the bigger firms. The government also favours a turnover ceiling of Rs. 2 crore; but the industry wants the cut-off limit pegged at Rs. 5 crore. The industry's argument is that as the government has raised the limit on fixed assets for plant and machinery in small units from Rs. 35 lakh to Rs. 60 lakh, a sales turnover ceiling of Rs. 2 crore will be too low. In view of this, the government may be forced to raise the ceiling to Rs. 3 crore.

Meanwhile, the government has started releasing orders regarding price fixation of drugs and medicines submitted by pharmaceutical companies which were pending with the department for a long time. Even though the Bureau of Industrial Costs and Prices (BICP), has reportedly vetted the price revision applications of these companies' the department was delaying a decision. It is believed that the delay was due to the conflict between the industry and the department over the release of BICP approved prices. However, the department has started releasing the price revision orders on the basis of the BICP assessment undertaken following the applications made by the companies. Though the industry is claiming that a large number of applications are still pending, the department officials maintain that prices of only about 80-90 drugs are still to be officially fixed under DPCO. Since this figure is assumed to be based on generic drugs, the actual number may be over 200 drugs, taking into account the fact that more than one company would be asking for upward revisions of the same drug.

---

### ARLABS

Arlabs has announced, a record dividend of 50 per cent, including the final of 30 per cent, for the year ended March 1990 against 30 per cent for the previous nine months (annual basis 40 per cent). The gross profit is up sharply to Rs. 288.21 lakhs from Rs. 154.33 lakhs in the past period. After depreciation (Rs. 120.46 lakhs against Rs. 60.31 lakhs) and taxation (Rs. 25 lakhs against Rs. eight lakhs) there is a net profit of Rs. 142.74 lakhs compared to Rs. 86.03 lakhs in the past period. The total dividend outgo is Rs. 49.65 lakhs, including the final of Rs. 29.80 lakhs compared to the last period's Rs. 24.62 lakhs.

# Drug companies seek more say in DPCO review panel

The pharmaceutical industry and trade have demanded representation in the standing committee, constituted in Feb. 1990, by the Department of Chemicals and Petrochemicals to review the Drugs (Price Control) Order (DPCO).

Members of the joint council of the industry and trade, at its meeting in Calcutta recently, took stock of the latest situation and concluded that with only government nominees in the standing committee and in the three expert groups under it, the views of the pharmaceutical industry and trade would be ignored. They view the presence of the two public sector drug companies, IDPL and HAL, in the expert group on turnover and production issues, as of little consequence.

Mr. Kishor R. Shah, general secretary of the All India Organisation of Chemists and Druggists, and the chairman of the joint council, Mr. Anant R. Thakore, general secretary of the Indian Drug Manufacturers' Association, Dr. S. Agarwala and Mr. P. Gupta, president and vice-president respectively of the Organisation of Pharmaceutical Producers of India, said that the centre should also set up a separate committee to look into the issue of the drug price equalisation account (DPEA).

Clarifying that the joint council was set up not to exert undue pressure on the government, but to seek reasonable return on investment and reasonable trade margins, the members said their decision to postpone the trade and industry bandh could be reversed if the centre persisted with its arbitrary style of functioning in the matter of price control of medicines. However, the joint council is still optimistic that the promises made by the Union Minister of Chemicals and Petroleum, Mr. M.S. Gurupadaswamy, would be fulfilled. The minister had assured the joint council members that no change in the drug policy would be undertaken and no further drugs would be brought under price control before the standing committee completed its review. The minister had also promised to go into the legality of the DPEA.

Questioning the rationale of an expanded net of price-controlled drugs, the joint council members pointed out that the government machinery is not sufficiently equipped to fix prices of more than 15 bulk drugs annually, as against the requirement of determining prices of 175 drugs. In this context, the decision to bring under price control 21 new drugs in February and five more in July this year could hardly be justified. These measures have pushed up the number of price controlled drugs from 127 at the end of last year to 153 at present. Apart from delay in having prices fixed, the margins for the industry and trade are reduced, he regretted.

Refuting the argument that prices of medicines are going up, the joint council maintains that after new DPCO came into force in August 1987, the increase in the controlled category has been 5.7 per cent and in the decontrolled category 7.7 per cent. Both figures are lower than the annual inflation figure, which reached 8.5 per cent in July this year. Moreover, 52 per cent of the formulation prices have either gone down or have not increased at all after the DPCO was enforced. If gradual deregulation was brought about in the drug industry, market forces would have pushed down prices anyway. Instead, the government has stuck to its decision to control more and more drugs.

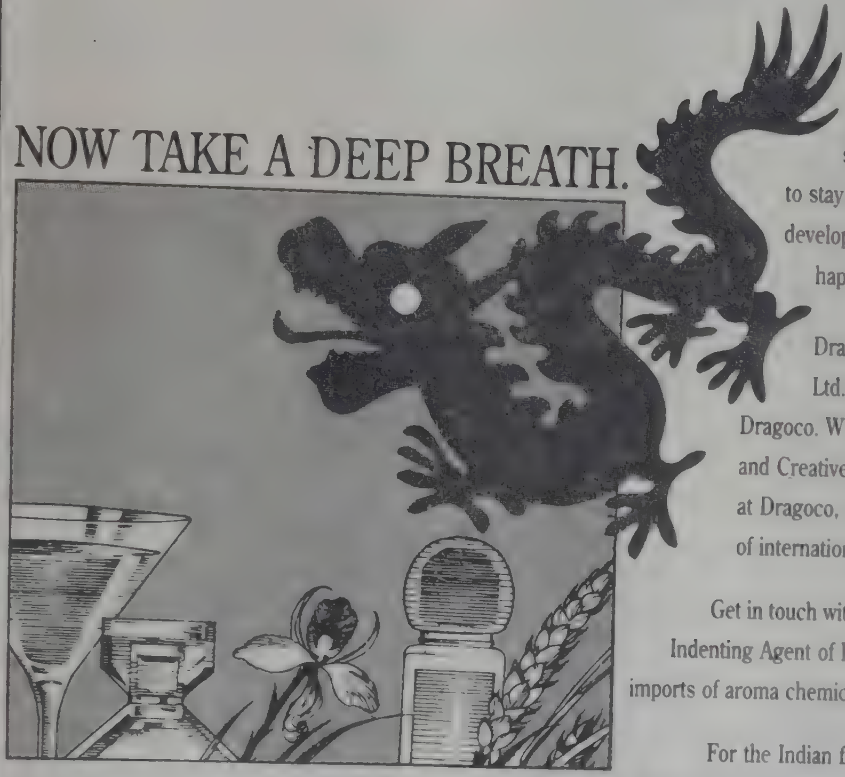
Noting that only 22.66 per cent and 15.11 per cent of the total medical treatment costs pertain to medicines in regard to home and institutional care respectively, the joint council feels that overemphasis on price control of drugs is wholly misplaced. This is all the more in the context of overall escalatic costs in the economy. The joint co members believe that these fi would convince all concerned that and more regulations in the drug in try can be introduced only at the of quality and availability of drug

## ALBERT DAVID

Albert David Limited, one of oldest pharmaceutical companies, poses to launch the latest broad s trum antibiotic ciprofloxacin both tablet and infusion forms. The comp has also initiated steps to produce he drugs, expand it's IV fluid range manufacture hypodermic disposa syringes and needles. The board directors of the company recommen dividend on equity shares at the rate fifteen per cent for the year en March 31, 1990, against 18 per cent annualised basis for the period en March 31, 1989.

During the period under review, turnover of the company increased Rs. 26.98 crores (Rs. 21.58 crores annualised basis in the previous ye representing an increase of over 25 cent. The gross profit jumped Rs. 2.45 crores (Rs. 1.7 crores) and pre-tax net profit to Rs. 9.02 cror (Rs. 8.6 crores). During the peri under review, a sum of Rs. 1.54 cror had been charged in the account towar depreciation, Rs. 22 lakhs have be provided for income-tax and Rs. lakhs allocated to investment allowan reserve. The board of directors propos to transfer Rs. 10 lakhs to gener reserve. The proposed dividend on pre erence and equity shares would abso Rs. 33.34 lakhs.

The board of directors expressed co cern at the future growth of the dr industry in view of the government refusal to grant price rise as per DPC 1987. The cost of packaging, which h increased enormously in the past fe years, had not been adequately covere it was noted.



# NOW TAKE A DEEP BREATH.

The dragon is here. Symbol of the world leader in speciality aroma chemicals.

Dragoco Gerberding & Company GmbH of West Germany is ready to usher in a new era for the Indian flavour and fragrance industry with unique speciality aroma chemicals. Like it already has in five continents through its development centres and technical application laboratories all over the world.

Now it's your turn to take your pick from the Dragoco range of 1000 speciality chemicals. And to stay on top of the latest developments in aromas as they happen across the globe.

Drachem Speciality Chemicals Ltd. is a joint venture with Dragoco. With Technical, Marketing and Creative personnel trained at Dragoco, to bring you products of international quality.

Get in touch with Drachem, the Principal Indenting Agent of Dragoco in India for your imports of aroma chemicals.

For the Indian flavour and fragrance industry, it will be a breath of fresh air.

**Drachem Speciality Chemicals Ltd.**
A 203 Blue Cross Chambers Infantry Road Cross
Bangalore 560 001 Tel: 563083/579228/570526

**C/o Chemicals and Plastics India Ltd.**
Jitendra Industrial Estate Andheri Kurla Road
Andheri East Bombay 400 093
Tel: 6346474/6346475

HTA 9167 A

# Govt. decides to broaden list of category I drugs

The ministry of petroleum and chemicals had decided to expand the list of drugs required for national health programmes (category I) under the Drug (Prices Control) Order (DPCO), 1987. This and other related drug categorisation decisions have been taken by the ministry on the basis of recommendations made by the standing committee set up by the ministry about four months ago to consider the representations made by various groups, including members of Parliament, on DPCO 1987.

The ministry has decided that all bulk drugs which are used to make formulations to meet the requirements of national health programmes will be "treated as category I bulk drugs" under the DPCO. According to ministry sources, "in the first instance, the ministry of health has been requested to provide a list of all such bulk drugs as are required for national health programmes". In keeping with the recommendation of the standing committee, the petroleum and chemicals ministry has decided to control the prices of calcium and iron formulations as they are used under national health programmes. The health ministry may consider including these items in the proposed category I list, sources say.

The petroleum and chemicals ministry has also decided to shift all ophthalmic preparations from category II to category I as the formulations are used for controlling eye ailments under national health programmes. It has also decided that all such combination formulations containing category I bulk drugs will be treated as category I formulations. Similarly, combinations containing a category II bulk drug with price-decontrolled bulk drug will be treated as a category II formulation. It may recalled that though this stipulation was stated in DPCO 1987, the government later clarified that such combinations will be categorised keeping in view the therapeutic value of combinations. It was stated that if a category I or category II bulk drug was incorporated as an add-on to enhance the therapeutic efficiency of the combination drug, then the formulation would not be categorised in I or II, as the case may be. At the time of incorporation of DPCO in August, 1987, the category I comprised 26 bulk drugs.

## INDECOR PAINTS LAUNCHES 'VINYCIDE'

A Madras-based small scale unit has achieved a breakthrough in paint technology by introducing, for the first time in the country, a dual-action insecticide paint based on French technology.

Indecor Paints and Varnishes Pvt. Ltd. has promoted a rupees one crore venture at Ambattur in Madras to manufacture 1250 tonnes per year of 'Vinycide' with the formula supplied by Artilin of France, a leading company which has mastered the technology over the last 50 years.

The factory was inaugurated recently by Mr. Robert Leaune, consular general of France in India. Talking to newsmen, Mr. G. Rama Rayudu, chairman and Mr. G. Raghunatha Rao, managing director of the company said that the tie-up also provided for complete transfer of technology by the French company after three years for the manufacture of concentrate of the new paint. That time, Artilin would take up 40 per cent equity.

It is then proposed to supply the concentrate to the small units. The company can also export the insecticide mixed paint to neighbouring countries. Mr. Hendri Autret, director export of Artilin said Vinycide was the outcome of years of research by French scientists. His company had been exporting the paint to 28 countries and 14 of them had
obtained licence for manufactur
concentrate.

He said the new paint-cum-i
cide had been certified by the
Council for Medical Research (I
Being non-toxic and non-solubl
absolutely harmless to humans an
Vinycide would destroy all ki
pests. It would find extensive a
tion in buildings for coating an
orative purposes. Mr. Rama R
said that being a small scale un
company had to pass through an
for over five years before obtaini
clearance for manufacturing the

## SHALIMAR PAINTS LAUNC TWO NEW DISTEMPERS

Shalimar Paints Ltd., has laun
two new distempers — No. 1 a
and No. 1 super acrylic washabl
temper. According to a com
release, there are 23 shades in N
acrylic and nine in pastel shades i
1 super acrylic.

The company has strengthene
manufacturing facilities at Howrah
has plans to have a second manufa
ing unit in Maharashtra. It propos
manufacture oil coatings, powder c
ings and polyurethane coatings, bes
other decorative and non-decora
paints in Maharashtra.

A memorandum of undertstan
has been signed with a leading Ita
paint company to manufacture oil c
ings and other industrial coatings,
release said.

## BONANZA DRUGS

Bonanza Drugs & Chemicals L
belong to the Lakhani group of c
panies, is planning to enter the cap
market to finance a Rs. 40-cr
expansion and diversification
gramme. Forty lakh equity shares
Rs. 10 each for cash at par aggrega
to Rs. 4 crores will be offered to Ind
public.

# WANTED

# MACHINERY FOR BULK DRUG

Glass lined reactor, new or second-hand
of 1500/2000 lit.
Sparkler Filter S.S. 316 Rubber lined/M.S.
Centrifuge 36" and 48" S.S. Condenser
bigger capacity

Write to:

**Post Box No. 2795**
**BOMBAY - 400 002**

---

## FOR SALE

**BRAND NEW**

**KHD HUMBOLDT WEDAG**

HORIZONTAL CENTRIFUGE
TYPE : S1 - 1

*USED FOR:* SLUDGE SEPARATION,
N PAPER & PULP INDUSTRIES AND
CHEMICAL INDUSTRIES

Interested Parties may contact:

**M/s. SRINIVASA**
**CYSTINE LIMITED**
G 2/6-3-658, Concorde Apartments
Somajiguda,
HYDERABAD - 500 482

**Phone Nos.: 212487, 210260, 210261**
**Telex No. 0425-6011 SCL IN**

---

This space
will cost you
Rs. 1000/- only

Please contact us for your regular bulk requirements of:

NICKEL SULPHATE
BRIGHT NICKEL SALT
NICKEL CARBONATE
PHOSPHORISED COPPER
NICKEL CHLORIDE
DULL NICKEL SALT
NICKEL SULPHAMATE
TIN - LEAD ANODES
HARD-BRIGHT CHROME SALTS

GUARANTEED BEST QUALITY COMPETITIVE PRICES PROMPT DELIVERY

ELECTRO CHEM TECH

**BOMBAY SALES OFFICE:**
133/C/8, V.P. Road, Nathulal Bhavan,
Bombay 400 004.
**Tel.: 4114826, 384858**

**MAIN OFFICE:**
3, Guru Smruti, Sardar Patel Road No. 1,
Udyog Nagar, Udhna 394 210, Surat.
**Tel.: 89247**

---

Chemicolour

**For Your Imports Of**

PANCREATIN
TARTARIC ACID
MONO SODIUM GLUTAMATE
GLUTAMIC ACID
LACTOSE BP/USP
EPHEDRINE HCl/PSEUDO
THEOPHYLLINE ANH. BP
8-CHLOROTHEOPHYLLINE
2-CYANO-4-NITRO ANILINE
SODIUM METAL
SULPHADIAZINE/DIOXINE
GUM ROSIN
GLYCERINE
ORANGE OIL
METHYL ETHYL KETONE
PROPYLENE GLYCOL USP
PARAFORMALDEHYDE
NAPHTHALENE CRUDE
BETA NAPHTHOL
SODIUM FORMATE
PHENOL BP/USP
BASIC CHROME SULPHATE
SODIUM BICHROMATE
MERCURY 99.99%
MICROCRYSTALLINE WAX
ACETYL CHLORIDE

Please contact for most competitive rates

CHEMICOLOUR INDUSTRIES LIMITED

302, T.V. Industrial Estate, Sudam Kalu Ahire Marg, Worli, Bombay 400 025.
**Telephone: 4933361/64 Gram: "KEMIKOLOR" Tlx.: 011-71223 CIL IN Fax: 4941612**

---

For Your Regular Requirement of:

MANGANESE CHLORIDE (98% Min.)

Used in Dyes, Polymerisation Catalyst, Linseed Oil Drier,
Fuel Oil Additives, Disinfectant)

MANGANESE ACETATE (99.5% Min.)

Used in Catalyst: Fibre Grade, oxidations.

MANGANESE CARBONATE (45% Mn)

BCE

Please Contact Manufacturers

BORG CHEMINOVA PVT. LTD.

8-Jamasji Apts, 32, Sleater Road, Grant Road, Bombay - 400 007.
Phone: Office: 362769; Resi.: 4301451/6493661

### NEW TECH FOR FERTILISER PLANTS

# Govt. to cut MEC

The Union government is planning to ring down the minimum economic apacities (MEC) for fertiliser plants to llow the use of new technologies. According to official sources, new technologies have of late emerged which an be used for small capacity fertiliser lants. These are as cost-effective and fficient as the existing technologies, it s argued.

If the new technologies, one of which as been developed by ICI, are to be sed in India, the minimum economic cales for ammonia and urea plants have o be suitably brought down. The resent minimum capacities of Snamporgetti are 1,350 tonnes per day (TPD) or ammonia plants and 2,200 for urea lants.

The margin by which these capacity evels would be brought down is yet to e decided. Expert opinion will be btained to decide on the new minimum apacity levels, once a final decision is aken to induct the new technologies uited for low-capacity plants.

In fact, the proposal for bringing lown the minimum capacities for urea nd ammonia plants is being considered, nainly as a follow-up measure to an xercise to explore possibilities of ncouraging use of alternative technologies for the fertiliser sector.

The agriculature ministry has already repared a paper on the alternative use f technologies for the fertiliser sector. The paper is now being examined by the ommittee of secretaries. Subsequently, he paper will be discussed by the cabinet also.

Official sources say that the idea of ringing down the minimum capacities or new fertiliser plants emanated from his paper only, where the emergence of he new technologies, including the one rom ICI, has been mentioned. It is pointed out that these technologies can be most suitably used for low-capacity fertiliser plants in the southern region of India using natural gas as the feedstock. There are several gas finds in the south with relatively small reserves, on the basis of which a large size fertiliser plant of the existing capacity (1,350 tpd of ammonia and 2,200 tpd of urea) cannot be set up.

The only alternative is to set up small capacity gas-based fertiliser plants, which may be as cost-effective and efficient as the large ones set up along the H-B-J gas pipeline route. The new technologies can provide this alternative, offical sources say.

The location of such small plants also would be most ideal. The southern states face periodic problems on account of inadequate fertiliser availability. With more small-sized gas-based plants proposed in the south, the problems of inadequate fertiliser availability will also resolved, it is said.

The policy papaer has also outlined the options available before the government as regards the choice of technology for new fertiliser plants. It points out that for expansion projects, it will be difficult to choose any technology other than of Snamprogetti.

This is because most of the projects, ready for expansion, have used the process know-how of Snamprogetti. Hence their expansion projects should also use the same Italian technology.

If, however, the government decides not to use Snamprogetti technology in any project of any type, then the expansion plans to the fertiliser industry will have to be reviewed accordingly, the paper has noted. About a dozen existing fertiliser plants, which have used the Italian technology, are proposing to expand their capacity.

The paper has noted that the government has already decided to beef up the Projects and Development India Limited (PDIL), a public sector consultancy firm, so that it could effectively substitute Snamprogetti for atleast new projects.

The search for alternative technologies for the fertiliser sector was initiated as it was alleged that Snamprogetti had monopolised the fertiliser consultancy business in India, more because of its close connections with the Rajiv Gandhi government than any intrinsic merit of its technology. Snamprogetti, it has been alleged, was favoured for most projects at the cost of PDIL and other companies.

---

## HEC TO MAKE EQUIPMENT FOR N-PLANT

The public sector Heavy Engineering Corporation (HEC) will manufacture machines and equipment for nuclear power plants.

The corporation chairman Mr. P.C. Neogi, said at Ranchi on Aug 15th, that negotiations were on with the Nuclear Power Corporation for supply of equipment and machines for setting up a 250 mega watt nuclear power plant. Mr. Neogi said the project would be launched within a year. To a question he said the HEC would also develop its in-house facilities. The HEC was diversifying production for defence purposes.

Referring to the order position the chairman said that but for the heavy machine building plant the order position was "comfortable". HMBP had orders worth Rs. 150 crores. The HEC was bidding for contracts for the Rourkela Steel Plant modernisaation programme, he said. Mr. Neogi said procurement of orders went up following Corporation's effort to ensure timely delivery. Advance strategy for manufacturing had been introduced and assembly time reduced to meet the schedules, he said.

# Tata Chem, Zuari Agro may lost gas-based fertiliser projects

The Union government may soon ask the Tatas and the K.K. Birla group to withdraw from the two gas-based fertiliser projects they are supposed to set up at Babrala in Uttar Pradesh and Gadepan in Kota district of Rajasthan, respectively.

The latest thinking at the highest level of the government is that it should look for alternative promoters for these two projects. It has already made quiet enquiries with Iffco and Kribhco, the two fertiliser giants in the co-operative sector, to find out if they can set up these much-delayed projects.

The government can however rope in Iffco and Kribhco for the two projects only after it revokes the letters of intent it had earlier issued to Tatas and the K.K. Birla group. There are such precedents of revocation of the original letter of intent and granting it to a new party, after the original promoter has inordinately delayed the implementation of the project.

For instance, the letter of intent for the Shahjahanpur fertiliser project was originally issued to the DCM group. It was revoked and awarded to the Swraj Paul group. Even this letter of intent had to be revoked, as the Paul brothers dilly-dallied on implementation of the project. Finally, it was given to Mr. Abhey Oswal, who is now implementing the project.

Official sources say that it should not be a problem either for Iffco or Kribhco to set up the Babrla and Gadepan projects, since they are both flush with funds and have been pleading with the government for quite some time to give them permission to set up new fertiliser projects.

The two co-operative giants also have an impeccable record of commissioning their plants on schedule without any cost over runs. Both are profitable ventures and are among the efficiently run fertiliser companies in the industry.

On the other hand, both the Babrala and Gadepan projects have been delayed for well over two years. They are located on the HBJ gas pipeline route.

The Babrala project was awarded to Tata Chemicals, while the one at Gadepan had gone to Zuari Agro of the K.K. Birla Group, which has set up a new company, Chambal Fertilisers, to implement the project.

The government's perception is that Tata Chemicals has too many mega projects on its hands and as such may not be very keen on the fertiliser project. Tata Chemicals is also implementing the Karnal refinery project in Haryana and the Haldia Petrochemicals complex in West Bengal.

As regards the K.K. Birla project at Gadepan, the government's view is that there has been considerable delay in setting up the plant, although a part of the delay is due to probelms related to environmental clearance, which ultimately forced the promoters to shift the location.

The three other fertilisers plants, set up on the HBJ gas pipeline route at Jagdishpur, Aonla and Vijaipur have already started their commercial production. Only one of these plants is in the private sector ( at Jagdishpur set up by the Aditya Birla group) and the other two are commissioned by the public sector National Fertilisers Limited at Vijaipur and by Iffco at Aonla.

The Tatas and the KK Birla group are also refusing to sign the contract with the Gas Authority of India Limited (GAIL) for supply of gas. (*See also p.* 75).

They have argued that the pen
visions for not using the commit
are harsh and that they should
forced to pay a deposit.

Such an approach, the gover
fears, will further delay the commis
ing of these fertiliser plants. The
ernment is quite keen on a
domestic fertiliser capacity to e
that its import bill for fertilisers do
go up during the Eighth Plan.

The bureaucratic delays in cle
the expansion projets and the del
commissioning of these three ferti
plants may result in a major shortf
the availability of domestically
duced fertilisers, forcing the govern
to go in for massive imports at a
its foreign exchange reserves are

The latest government move is
in response to a combination of fac
including the dilly-dallying approac
the big houses on implementing the
projects, the two co-operative fertil
companies' proven track record of q
execution of projects and the prosp
of higher fertiliser imports to m
domestic shortfall.

---

## PPL APPOINTED MAIN FERT
## LISER SUPPLIER FOR ORISS

The state-owned Paradeep Phosph
Limited (PPL) — the largest mod
nised di-ammonium phosphate (DA
fertiliser plant in Asia, has be
appointed as a lead fertiliser supplier
Orissa by the Centre.

As recommended by the governme
of Orissa, the PPL will act as a le
coordinator for supply of fertilisers
the state under the lead fertiliser schem
for a period of three years starting fro
the current kharif season.

In view of this, the PPL has requeste
allied companies to extend their coo
eration in supplying fertiliser on time
meet the demand in the remote an
inaccessible areas.

ERTILISER PROJECTS

# GAIL restrained from cancelling allocations

he Delhi High Court has prevented as Authority of India Ltd., (GAIL) om cancelling any gas allocation to ata Chemicals Ltd. (TCL) and Chamal Fertilisers Ltd. and directed preservon of the status quo. A division bench the Delhi High Court comprising of stice S.B. Wad and Justice Usha lehra issued the notice upon a joint etition filed by the two compnies in onnection with gas allocation for the rtiliser projects. TCL is to set up its nits at Babrala while Chambal Fertisers at Gadepan in Rajasthan.

The writ petition contended that AIL should not compel them to exeute a contract which was ''per se arbiary and unconscionable''. The main rayers in the petitions were: a) manamus directing GAIL and the Govnment to supply required quantity of is from HBJ pipeline for the fertiliser ants at reasonable prices and at reaonable terms and conditions to be seted between the parties by mutual egotiations; b) declaring that the price Rs. 2,250 per 1,000 cubic metres emanded by GAIL for supply of gas arbitrary, unreasonable and against ıblic interest; c) prohibiting GAIL om cancelling the allocation of gas ade in favour of the companies on the ound that they have not executed the vised draft contracts.

A battle has been going on between AIL and the fertiliser companies, ing set up by Tatas and Birlas. Both irlas and Tatas have been going slow the fertiliser projects while GAIL has en the sufferer as it is not being able get a return on the capital investment ade in building the HBJ pipeline. The iblic sector fertiliser units have set up eir plants on schedule giving little cuse for the private parties not to stick schedules. Mr. Aditya Birla, in the ivate sector, has been operating his ompany Indo-Gulf Fertilisers based on HBJ gas. In the world over, such penalty clauses are levied and commitment charges made.

In this case, there has been the argument that GAIL is not bound by the contract in the sense that nothing can prevent it from reducing supply of gas. Otherwise GAIL seems to be on strong ground with the disputed contract envisaged payment of Rs. 4.4 crores as deposit money and a futher guarantee (bank) of Rs. 13.2 crores attracting an eight per cent interest. Chambal Fertilisers had to shift location owing to environment restrictions. But it also had problems over raising the promoters' contribution though now the company seems to be keen on going ahead. Similar statements have been made by Tatas. Perhaps, the basic problem is the unviable fertiliser pricing policy which is making the units move warily as it may not be able to enthuse the public to invest monies, when issues are made.

Sources also point out in this connection that the massive gas flaring in Bombay High is mainly owing to private manufacturing units not being able to keep to production schedules.

## FACT EARNS REDUCED PROFIT

The public-sector Fertilisers and Chemicals Travancore Ltd. (FACT) made a reduced operating profit of Rs. 7.34 crores in 1989-90, as compared to Rs. 36.22 crores the previous year. The Cochin-based fertiliser unit suffered production losses during the year owing to constraints such as chronic power shortage and non-availability of imported phosphoric acid and ammonia. But for these constraints, FACT could have increased its production of urea and complex fertilisers, said the annual report for 1989-90.

GC

MARK OF QUALITY
NOW AVAILABLE IN ANY QUANTITY
AS AND WHEN REQUIRED BY YOU

**BENZYL CHLORIDE**
**BENZO TRI CHLORIDE**
**BENZOYL CHLORIDE**
**BENZALDEHYDE**

**GWALIOR CHEMICALS PVT. LTD.**

**Factory:**
Birlagram
NAGDA - 456 331
(M.P.)
**Phone: 283/104**

**Regd. Office:**
29, Bank Street 1st Floor,
BOMBAY 400 023.
**Phone: 2862453/2863021**
**Gram: "METALDIST"**
**Telex: 011-6554 MINA IN.**

**Rs. 170-CR FCI REVAMP PLAN**

## New lease of life for two units

Rejecting earlier plans to close down the four ailing units of the Fertiliser Corp. of India Ltd. (FCI), the Union govt. has, for the time being, approved a Rs. 170-crore investment programme to revamp the company's Gorakhpur and Ramagundam units. The govt. has thus implemented the first phase of the Rs. 330-crore rehabilitation plan drawn up by the finance and fertiliser ministries for the four sick FCI units.

The investments, it is maintained, will allow the public sector fertiliser giant to get the maximum possible benefit out of its existing plants for a period of another 10 to 15 years. After the entire investment programme is implemented, production is expected to go up to 11 lakh tonnes from the current annual production of around 8 lakh tonnes.

In the current phase, the government has decided to spend Rs. 102.31 crores in setting up a captive power station and in revamping the Ramagundam complex. The rehabilitation of the Gorakhpur plant at a cost of Rs. 66.65 crores has also been approved but actual implementation would only be taken up after receipt of a health study of the plant currently being carried out by the Projects and Development India Ltd. Meanwhile, non-plan support is to be continued to enable FCI to tide over its financial problems and ensure uninterrupted supply of inputs.

The company's accumulated losses until March 1990 is a whopping Rs. 1235 crores. The revamp of the other two plants at Talcher and Sindri — would cost Rs. 74 crores and Rs. 88 crores, respectively. The government has rejected the plan to scrap these units as it would result in a loss of fertiliser availability to the country. FCI's Sindri plant accounts for an output of three lakh tonnes, Ramagundam 1.63 lakh tonnes, Talcher 1.85 lakh tonne
Gorakhpur 1.71 lakh tonnes.

Another factor that weighe
scales against closure of the plants
loss in foreign exchange of app
mately $126 million per annun
importing the same quantity of ur
international prices. There was als
question of retrenchment of ar
11,000 employees — the 'golden h
shakes' would have cost a whop
Rs. 207 crores. Furthermore, the
benefits of scrapping the old plants
not favourable enough. The govern
would have to spend Rs. 800 cror
set up a new plant with a capacity
ilar to that of the four plants.

The main problems plaguing the
units have been non-availabilit
power on a continuous basis at R
agundam and Talcher, as also poor
ity of feedstock — coal — by t
units. Coal-based technology
making fertiliser has not yet stabi
and had caused nagging problems
these two units. A severe finan
crunch in Gorakhpur has hit produc
in the plant.

Among the steps taken by the
ernment to put the coal-based unit
a better footing were the pegging
capacity utilisation norms for reten
price fixation at 60 per cent instea
the industry norm of 90 per cent.
the additional subsidy was to
adjusted against payment of loans
vided by the government to FCI ear
In 1989-90, however, in view of
financial condition of FCI, around
the additional subsidy element (Rs
crores) was paid by the governmen
cash.

NIRMA'S New Product :
GLYCERINE (REF/CP/IW)
(Manu :- by M/s NIRMA PVT. LTD.)

Available in Ready Stock:

Contact : M/s ADVENTURE

57, Embassy Market, Near Dinesh Hall,
Ashram Road, Ahmedabad-380 009.

Phone : (O.) 448996 (R.) 461496
Telex : 0121-6343 SKET-IN
Attn. : Ph. 448996
Fax : 91-272-468542 : Attn. Ph. 448996

### APPOINTMENTS

**Mr. M.M. Sud** has been ele
president of the All-India Flat T
Manufacturers' Association at its
annual session held at Bangalore
July 21, a news release from the a
ciation said. **Mr. Swaminathan**
**Mr. Lalit Tulsyan** have been v
vice-president and treasurer, resp
tively, the release said.

# atisfactory performance by Colour-Chem

Colour-Chem Ltd., has reported sat- actory performance for the year ended rch 1990, inspite of considerable ses due to damages as a result of ods. The following are highlights of ir performance:

### ancial performance

Sales turnover of Colour-Chem went to Rs. 111.73 crores from Rs. 101.47 res. Pretax profits were down to 3.40 crores from Rs. 9.07 crores. es of chemical intermediates were ited by the installed capacities. The npany has also switched over to ect selling after discontinuation of olesale selling arrangements during previous year.

However, the profitability has been versely affected by the damage and ruptions caused by the floods at the ha plant. Estimated loss of inventor- was approximately Rs. 90 lakhs. rther there was loss of production in ha (closed for nearly six weeks) and excess amount spent on repairs and intenance which went up to Rs. 2 res from Rs. 1.65 crores.

### port/import transactions

The company showed a substantial rease in export earnings. Exports nped 54% from 10.87 crores to 16.75 res. The total imports of raw mater- by the company went down to 4.1 crores from Rs. 4.7 crores.

### hers

Two significant changes occurred in organisational set up of the com- y. The equity holding of Bayer A.G. 16.4% has now been transferred to echst A.G. whose total holding in the npany is now 32.8%. The company s also been enlisted with the task of moting the sales of chemicals and ustrial products manufactured by dif- ent divisions of Hoechst AG. During year the company also changed its rketing structure by dispensing with wholesale selling organisation and orting to direct selling.

### Future

The company is gearing itself to meet the demand for pigments for increasingly sophisticated non-textile applications for its range of leather chemicals. Further the perspective plan for the C.I. drawn by Government of India seems to enhance growth of dyestuff industry. However for ensuring growth, certain policy changes particularly in relation to discriminatory and high excise tariffs will have to be dropped.

---

## NALCO OUTPUT EXCEEDS TARGET

The National Aluminium Company Limited (NALCO), a public sector undertaking under the Department of Mines, produced 11,674 tonnes of aluminium during July this year against a target of 4,000 tonnes. Aluminium production in all the plants in the public and private sector during the month has been over 36,200 tonnes while the cumulative production for the period April-July 1990 was over 1.27 lakh tonnes.

In July, NALCO produced 45,000 tonnes of alumina and 11,674 tonnes of aluminium metal but did not produce any bauxite as production in the mines had to be temporarily suspended on account of accumulation of stocks.

The accumulation was due to disruption in railway movement following the severe cyclone in Andhra Pradesh. This resulted in suspension of production in the alumina plant from May 16 to June 25.

NALCO exported 10,124 tonnes of alumina after partial restoration of rail traffic on June 22 and earned Rs. 7.05 crores in foreign exchange during July.

The issue of according higher priority to the movement of alumina has been taken up separately with the Railways.

AVAILABLE

* Synthetic Khadi
* Cotton Khadi

Contact Manufacturers:

NEOPRINT
COLOUR & CHEMICALS

101, Matru Chhaya, 378/380, Narsi Natha Street,
BOMBAY 400 009.

Phone: 348727, 336561

CHARTER-HIRE OF DRILLSHIP

# ONGC stayed from cancelling LI

A Bombay-based drilling contractor Amership Management Pvt. Ltd., has won a stay order from the Bombay High Court restraining the Oil and Natural Gas Commission (ONGC) from cancelling a letter of intent (LI) awarded to it for charter-hire of a drillship, and awarding the contract to any other party.

In July, the interministerial steering committee that finalises all oil sector contracts, had recommended the cancellation of the LI awarded to Amership subject to legal opinion, and the invitation of fresh price bids for the drillship contract. The committee's recommendation came in the wake of protests from some of the other bidders that Amership had violated the tender norms by substituting the drillship it had earlier identified with another ship. Amership, one among the seven companies which bid for the ONGC contract last October, had initially identified the drillship Glomar Pacific, owned by Glomar Marine of the U.S., as the vessel it would lease and deploy, when the technical bids were opened. The offers of some of the other bidders were not considered as their foreign collaborators for the project did not meet the specified experience criteria. Of the bids, considered, Amership's quotation was the lowest, at Rs. 34,000 a day.

In June this year, after the LI was awarded to Amership, it informed the ONGC that Glomar Pacific was being substituted with another drillship, Foresight Driller-II, owned by the London-based Foresight Group. Amership explained this substitution by saying that since about eight months had passed after the tender's flotation, Glomar Pacific was not immediately available for deployment, while Foresight Driller-II was available.
after, Foresight Driller-II was clear
the ONGC's bid evaluation comn
as being technically acceptable.
other bidders cried foul, saying
under the tender norms, substituti
the drillship was not allowed. Fu
Amership was accused of withho
information about the availabili
Glomar Pacific before it was aw
the LI. They pointed to the fact t
early as November, 1989, Gl
Pacific had been bought over
Norwegian firm, Sven Boedtke
$7.7 million, following bankruptc
cedings filed against Glomar M
The vessel's name, too, was chang
Deep Sea Pacific.

The ONGC's bid evaluation con
tee tried to defend its decision by p
ing to pecedents where bidders had
permitted to substitute the vessels
tified earlier. This reasoning, how
was challenged by Amership's ri
who said that the precedents relat
cases where the bidders were
required to identify the vessels a
time the technical bids were op
Further, atleast two of these
involved the substitution of a fo
vessel with an Indian-flag vessel w
was in conformity with the ON
policy of supporting indigenisati
oilfield services. It was also point
that if tendering norms can be re
to allow Amership the facility of
stituting the drillship after the L
awarded, other bidders, too, shou
allowed similar concessions.

One of the bidders, Bombay Off
Supplies Services (BOSS), whose
was not considered on the grounds
its collaborator lacked the requ
experience to undertake the contrac
since tied up with Jebsens Drilli
Norway, which fulfils the exper
criteria. The company now wan
offer to be reconsidered. Another
to the case is the insistence o
directorate-general of shipping
preference be given to Indian-flag
ships in the awarding of contrac

AVAILABLE

Formic Acid 85%

Manufactured by:

Gujarat Narmada Fertilizer Corpn. Ltd.

Sultanchand Bimalprakash

Kiran Mansion, 4834/24, Ansari Road,
New Delhi-110 002.
Phone: Off.: 3275955 & 3275956 Resi.: 2510057
Telex: 031-61441 SCBP-IN

# s. 50-crore ONGC effort to locate oil in Bay fails

ollowing the failure of the Rs. 50
e ONGC effort to locate oil or gas
ne Bay of Bengal, the offshore dril-
ship, Hakyuru 9, belonging to the
an Drilling Company, has weighed
hor from the Bay of Bengal. This
was hired for the last three years
he ONGC to drill five offshore wells
he shallow waters of the Bay of
gal. Since the attempt failed, the
drilling ship may not resume dril-
in the Bay of Bengal during the
aining years of the Eighth Plan.

alking to *Business Standard*, the
onal director (central region) of
GC, Mr. K.N. Bhabe, said that the
collected from the five wells drilled
ne Japanese company would now be
ysed at the Regional Computer
tre of ONGC in Calcutta and at the
Malaviya Institute of Petroleum at
radun. He said since mapping tech-
es had undergone changes, ONGC
d now select better drilling spots.
drilled wells may not have pro-
d oil or gas but have provided val-
e information about the sub-surface
r the waters, he added.

. Bhabe said the study of the data
t take even three years. Even if a
ion was taken to resume offshore
ng in the Bay of Bengal, the pre-
ons would take about one and a
ears. Thus, drilling isn't likely to
ne in the Bengal offshore for a
num of four and a half years, that
the end of the Eighth Plan period.

GC is now working with three
g rigs in the onshore areas of West
al. One of these is at Golf Green
Sonarpur and another at Lahil in
Bengal. The third rig is now
shifted from Chandkuri to Ichha-
he three rigs will continue to work
current year and hopefully in the
ear too, ONGC is now approving
g programme on a yearly basis as
estment plans for the Eighth Plan
period is yet to be approved by the government. ONGC, however, has got technical clearance for about a dozen drilling areas but they all require financial clearance.

A section of the ONGC officials however, fear that a resource crunch may hit West Bengal projects. When funds will be in short supply, the first priority will be to put in money to develop the discovered wells of oil and gas. Fresh exploration will come next. In fact, there has to be greater emphasis on exploitation of the discovered wells if the current world oil crisis drags on. There will be pressure to increase indigenous production to save foreign exchange on oil imports.

The Golf Green well is being drilled under technical supervision of the Soviets under the intensive integrated exploration programme drawn up under an Indo-Soviet protocol signed three years ago. While costs are being met by ONGC, the technical advice and data interpretation are being given by the Soviets. The programme will continue even after the 6,000 metre-deep Golf Green drilling was completed.

## DUPHAR INTERFRAN

Duphar Interfran has fared well during the year ended March 1990. The pre-tax profit is up sharply to Rs. 137.70 lakhs from Rs. 96.20 lakhs in the previous 15-month period following an increase in sales to Rs. 32.99 crores from Rs. 31.33 crores. The company has declared a dividend of 14 per cent on the enlarged capital. Last time, it paid 17.5 per cent for the period (annualised basis 14 per cent). After taxation (Rs. 34 lakhs against Rs. 19 lakhs) the net profit has increased to Rs. 103.70 lakhs from Rs. 77.20 lakhs in the past period.

GLASS DISTILLATION UNITS

20 lit to 200 Lit. ALL GLASS DIST.
AND REACTION UNITS

WE MANUFACTURE

- HCL Absorbers Cascade Coolers Etc.
- Visible Flow Glass Pipeline Heat. Exchangers. Tee, Bends, Columns. Teflon Gasket, Metal Flanges, Etc. QVF Type upto 9"
- Quick Fit Type Interchangeable Laboratory Glass Appartus. Instruments and Appliances
- High Vacuum Gauges. Mercury Manometer & Switches.

LELE'S ALWAYS THE FIRST

★ In 1939 Late Dr. S.R. LELE World Known Glass Technologist Started M/s. I.E.A. to Manufacture Borosilicate Glass
★ In 1963 This Co. was reformed as BOROSIL GLASS WORKS LTD. for making CORNING GLASS.
★ In 1989 he started SILICA WARE P. LTD. to Mfg. Custom made Glass Equipment.

SILICA WARE (P) LTD.,
54-C CHOTANI ESTATE, PROCTOR ROAD
GRANT ROAD, BOMBAY: 400 007.
PHONE: 357442 GRAM: LELESR
BOMBAY: MAHIM

UNIT NO. 2
92/B G.I.D.C. Nandesari Industrial Estate
NANDESARI Dist: BARODA. PHONE: 60383
Baroda City(O.) ■ 322382 ■ Resi 320187

Representatives:-
■ HYDERABAD. Mr. VINAY KUMAR
Plot No. 7, P & T Colony.
Behind R.R. Labs. HYDERABAD.
Telephone: 853821
■ MADRAS: Mr. K. VAIDYANATHAN
Flat No. 10/1 2nd. Loop Str.
Tamilnadu H.B. Colony.
Kotturpuram, MADRAS. 600 085.
Phone: 418758

PRINT-DESIGN

### DISCOURAGING IRON ORE EXPORTS

# Commerce Ministry opposes proposal

The Union Commerce Ministry is up in arms against the Steel Ministry's proposed five-point strategy under which exports of iron ore is sought to be discouraged in favour of exports of value added products and diversion of investments to develop ore exports is stressed to increase steel production. Already, as a spin off of the anticipated change in policy towards exports cf iron ore, the Minerals and Metals Trading Corporation of India Ltd. (MMTC) has put on hold investments worth Rs. 400 crores in developing port facilities and mining infrastructure to facilitate iron ore exports.

According to official sources, the Commerce Ministry has complained that the Steel Ministry's attitude towards iron ore exports will jeopardise foreign exchange earnings of around Rs. 1000 crores per year at present. Out of this, as much as Rs. 800 crores is earned in free foreign exchange. What has confounded the Commerce Ministry is the emphasis on exports of value added steel products even when the country has reserves which, according to a recently revised estimate, could last for a good 350 years at the present rate of consumption. In the last 30 years, fresh surveys have added another 11,000 tonnes to India's reserves, which is many times more than the consumption in this period.

On the other hand, it is argued that the Steel Ministry's stress on value added exports may be a little premature in the face of slowly rising sponge iron, pig iron and steel production. Given the budgetary constraints faced by the country and shortages of vital raw material for steel making, like coking coal, it is unlikely that fresh capacities will come up quickly enough to fill the gap
ore exports are curtailed or sto
Then again, unless sufficient ince
in terms of export subsidies ar
vided, value added exports will
uncompetitive in the world m
given the very high cost of prod
in India.

It is also argued that the f
exchange earnings out of iro
exports are without any strings at
— there is no provision of cash
pensatory support or rep licences a
exports. This means that almo
entire earnings are in free f
exchange. Iron ore is the fifth l
foreign exchange earner for the
try while India is the third large
ore exporter in the world, after
and Australia.

Under the circumstances, the
merce Ministry, in a communica
the Steel Ministry, has argued
may not be a wise policy to disco
the export of iron ore. The Steel
try has lobbied for value added e
on the ground that the ore mines
are now catering to exports w
required to feed domestic produ
Domestic ore consumption is ex
to go up to around 50 million ton
year within the next six years,
around 20 million tonnes at p
Also, the new national mineral
announced recently has speci
called for value added exports o
erals in view of the mineral inv
position and the long term needs
country.

In view of the signals coming
the Steel Ministry, the MMTC ha
ded to postpone and, if necessary,
expansions planned in Madras,
deep and Visakhapatnam ports
on larger ships. Brazil and Austr
already exporting ore in ships w
carrying capacity in the range of
3.6 lakh tonnes per vessel. India
are not equipped to handle such
their capacity being limited to
imum 1.2 lakh tonnes per vess

For your Requirements of:

ACETATE ▫ CARBONATE
CHLORIDE ▫ CHROMATE ▫ DIOXIDE
HYDROXIDE ▫ NITRATE ▫ OXIDE ▫ PHOSPHATE
SULPHATE Etc.
— OF —
CADMIUM ▫ COBALT
COPPER ▫ LEAD ▫ NICKEL
MERCURY ▫ STANNOUS (TIN-II) ▫ ZINC
AND OTHER INORGANIC CHEMICALS

AMMONIUM BI CHROMATE TECH, PURE & EXTRA PURE
POTASSIUM BI CHROMATE A.R. AND
POTASSIUM CHROMATE.

ACE CHEMICALS

Bombay Sales Office:
A-1, Sahyadri, Pandurang Wadi,
Goregaon (East), Bombay-400 063.
Tel. 6882232 ▫ 6882614

Regd. Office & Factory:
Plot No. N-11, M.I.D.C.
KUPWAD-416 425
Dist Sangli, (Maharashtra).

Print Design

### CONCESSION TO TAP FIs FOR RUPEE FUNDS

## Centre not to extend forex loan to Haldia

Haldia Petrochemicals Limited will have to finance the foreign exchange requirements of its naphtha cracker project through foreign equity participation, commercial borrowings and export earnings. This is one of the 10 stipulations specified in the revised letter of intent for the project issued by the Union industry ministry to the West Bengal Industrial and Development Corporation on August 10. Three stipulations are in addition to the standard conditions attached to a letter of intent.

The additional conditions, which have not been made public by West Bengal government, say: "The company will finance its foreign exchange requirements for import of capital goods, import of knowhow, servicing of foreign equity, foreign loan and import of feedstock, if any, through foreign exchange obtained by way of foreign equity participation, NRI equity on a non-repatriable basis, commercial borrowings as may be permitted by government according to the financing plan that may be approved for which debt servicing liability and any other foreign exchange costs should be met by exports earnings of the company.

The industry ministry has, however, not explicitly stated that the government will not provide free foreign exchange resources for the project. In the case of the naphtha expansion project of National Organic Chemicals Industries Limited (NOCIL) and the Vizag WB project, the industry ministry imposed the same condition with a rider that "no free foreign exchange would be made available to the company for such purposes (feedstock import of naphtha on an international basis for NOCIL and beyond what is available indigenously for Vizag will have to be covered, simlarly, through their own foreign exchange earnings.)". This clause is not included in the LI for Haldia. Moreover, the project will be allowed to convert a part of any external loan into equity. The industry ministry has, however, given a major concession to Rs. 3,000-crore Haldia project with regard to the rupee component of the project.

The revised letter of intent, addressed to WBIDC, says: "You may approach the Indian capital market and financing institutions and banks for subscription to the Indian component of the equity and loans". In the case of the NOCIL and UB projects, the government had stipulated that the promoters will not tap financial institutions for rupee funds.

NOCIL's letter of intent, for instance, clearly says: "The company shall not approach the financial institutions for capital requirements but there could be no objection to raising funds from the capital market subject to necessary approvals." Another major stipulation for Haldia project is the restriction on start of construction work of the project. The letter of intent says that "no construction activity relating to the proposal shall be undertaken by the company until environmental clearance as well as clearance for any forest land involved for any related activities of the proposal are approved by the (Union) ministry of environment and forests." The industry ministry has pointed out that this letter of intent does not constitute an authorisation under the Monopolies and Restrictive Trade Practices Act, 1969. "Wherever applicable, such permission or clearance as may be required under the provision of the Act should be separately obtained by you before taking any effective steps for the implementation of the letter of intent.

This imples that the Tatas, the private sector partner in the Haldia project, will have to seek approval under section 22 and section 23 of the MRTP Act from the department of company affairs.

FOR BEST CIF PRICES OF

PARAFORMALDEHYDE
(SPANISH)
89%, 91%, 93%, 96%, 97%

Contact:
FLUORODYECHEM
Swagat Co-op. Housing Society,
Building 3/A, Block No. 1,
"Damodar Park".
L.B.S. Marg, Ghatkopar,
Bombay 400 086
Phone: 581958/587264
Cable: FLODYES
Telex: 011-75806 FLOR-IN

# TN's alcohol policy affects chemical units

Tamil Nadu government's decision to relax its decades-old prohibition policy has ushered in a dry spell for the state's chemical industry.

Diversion of alcohol for potable purpose has affected the expansion plans of several units and put off plans for new units. In some cases, it will mean increased foreign exchange outgo on products which could have been produced within the country from alcohol.

Among the affected units is the PVC unit of DCW Ltd. The company has received a letter of intent to double its existing PVC capacity to 50,000 tonnes. DCW currently produces PVC from imported ethylene dichloride. The company had sought alcohol allocation from the state with a view to reduce dependence on imported intermediates.

With the state government now promoting the potable liquor sector, there is little hope for change over to the alcohol route to produce ethylene. As a result, the company will have to fall back on additional imports of intermediates to implement its expansion programme. This will mean avoidable foreign exchange outgo compared to import of PVC resin. India produces only a fraction of the 2.5 lakh tonnes of PVC it consumes annually.

Ostensibily to wean people away from illicit liquor, Tamil Nadu government proposes to market liquor in pilfer-proof plastic containers. Social organisations, especially women's bodies, have protested against the policy which they fear will usher in another operation flood leading to the ruin of households all over the state.

Ironically, the state government announced the policy for allocation to arrack and industrial sector on the same day — February 15. It allotted 750 lakh litres for industrial purposes and 650 lakh litres for arrack whereas the state's total production is in the region of 750 lakh litres.

Chemplast, another PVC producer in the state, (following the alcohol route) is expanding its capacity to 30,000 tonnes. DCW is implementing a Rs. 10-crore modernisation programme which would increase its capacity by another 10,000 tonnes.

Meanwhile, PVC global price continues to rule at about $600 a tonne, relatively unaffected by the Gulf crisis. Local producers who are nursing several months inventories are discontinuing discounts and credits which they were forced to give in the last several months because of competition from cheap imported material.

## FINOLEX PIPES TO ENTER CAPITAL MARKETS

Finolex Pipes Ltd., is entering the capital market with an issue of 79,30,000 — 14 per cent secured redeemable convertible debentures of Rs. 150 for cash at par, aggregating Rs. 118.95 crores, to part-finance the company's Rs. 352-crores PVC resin project.

The project will come up at Ranpar, near Ratnagiri in Maharashtra and have a capacity to manufacture 1,00,000 tonnes of PVC resin per annum. Out of the issue, convertible debentures aggregating Rs. 16.10 crores are being offered on a preferential basis to the debenture holders of Finolex Pipes Ltd., Rs. 10 crores convertible debentures to non-resident Indians, Rs. 9.75 crores to financial institutions/mutual funds, Rs. 8 crores debentures to the employees of the company and the balance of Rs. 59.50 crores are being offered to the general public.

Besides, the company is also issuing 27,36,667 convertible debentures aggregating to Rs. 41.05 crores to its shareholders on a rights basis in the of 25 convertible debentures for e 100 equity shares held on the re date (September 4, 1990).

The PVC project will provide b ward integration for the company also meet the PVC requirements o group company Finolex Cables according to Mr. P.P. Chhabria, c man. PVC being an economic, du and highly versatile thermopl material, is increasingly being use many consumer and industrial prod

Finolex Pipes will be employing proven Hoechst technology throu technical collaboration agreement Uhde GmbH, a wholly owned sub iary of Hoechst AG, a leader in field. The other strengths of the pro are its coastal location which will en savings in transport on cost, hand and bulk storing of imported raw m ial and ample scope for future ex sion.

The company is also entitled to p eer status and other concessions inc ing sales tax benefit for a period o years. The middle level demand PVC resins in the country is estim at 4,85,000 tonnes per annum 1994-95.

## ONGC TO BEGIN DRILLING MP

The Oil and Natural Gas Commis (ONGC) will soon start drilling op tions in Madhya Pradesh to assess prospects of petroleum and natural deposits.

This was conveyed by ONGC pro general manager Bhagwan Saha state chief secretary R.P. Kapoo Bhopal recently.

Dr. Sahay said the ONGC would drilling operations at Jebera villag Damoh district in October, accordin an official release.

# Jute use order stifles plastic sack units

The plastic sack manufacturing ndustry in the country is facing a crisis vith almost two thirds of its 500 units, nost in the small scale sector, on the erge of closure. Unless the Centre akes a "non-biased" decision on the nandatory jute use order, uninfluenced y powerful political lobbies, its survival can be ruled out.

Voicing their concern for the umpeenth time, representatives of All India Flat Tape Manufacturers' Association old newsmen at Madras on August 23 hat the Government was shuffling and eshuffling its policies regarding the HDPE units at the instance of less than dozen or so "jute barons". At no point f time, the Government took note of he economic implications of the policy, hey alleged.

According to Mr. M.M. Sud, the President of the Association, the compulsory jute use order, which stipulates hat 100 per cent of foodgrains, sugar, rea and 70 per cent of cement should e packed by jute is "wholly ridiculous". For one, the present jute sack roduction, dependent on the vagaries f nature, is inadequate to meet the total oodgrain production of 170 million onnes and sugar of 10 million tonnes.

Second, expert studies have proved hat seepage loss is very high when ement is packed in jute bags. The loss s estimated at Rs. 200 crores per nnum, he claimed. Both manufacturers of urea and cement wanted to use nly plastic sacks due to their low cost nd minimal waste. That being the case, here is no logic behind the jute reservation order, Mr. Sud pointed out.

The Association urges the Government to allow open competition etween the jute sack and plastic sack nits in the cement and urea market. It as also called for removal of excise uty of Rs. 4.62 on one kg of plastic ape. Mr. R. Swaminathan, Vice President of the Association said only 40 out of the 77 plastic sack units in Tamil Nadu are now functioning. Even these were utilising only one third of their capacity, he added.

## IOL TO EXPAND R & D ACTIVITY

IOL Limited's future R & D activities are likely to be directed towards gas packing technique for food preservation, development of indigenous materials for manufacture of high alloy welding electrodes and indigenous components and products for air separation plants and equipment and in-transit refrigeration technology through cryogenic application.

The company's annual report for the year ended March 1990 indicates the areas in which R & D activities have already been carried out. These include the application of oxygen for biological treatment of effluents, liquid nitrogen for cryogenic food freezing, development of lox cartridge with improved quality and efficiency, development of submerged arc welding flux and design and development of testing apparatus to evaluate oxygen compatibility of materials to be used in air separation plants and equipment.

The benefits obtained from these include savings in capital and space requirement, improvement in products quality for export, cost saving and import substitution, the report adds. During 1989-90, the company imported technology for the manufacture of argon purification plant which is expected to be ready in the current financial year. During the year, the total foreign exchange outgo was Rs. 10.54 crores and foreign exchange earned, Rs. 1.20 crores.

The company's exports covered welding products and accessories, blended powder, core wire, health care products, special gases and plant spares. A breakthrough was achieved in the African market for supplying anaesthetic equipment. A substantial portion of the Indo-Zimbabwe deal was used for export of blended powder and health care products to that country.

IOL's turnover at Rs. 168.36 crores for the year ended March 31, 1990 showed an improvement of 14 per cent over 1989 on annualised basis. The profit for the year ended March 1990 before depreciation interest and tax, Rs. 20.95 crores against Rs. 17.36 crores (1989) on annualised basis. However, profit after interest and depreciation dropped to Rs. 24.92 lakhs (Rs. 3.30 crores) due to high depreciation and interest charges Rs. 20.7 crores (Rs. 14.06 crores) following the heavy capital expenditure incurred in the previous three years mainly from borrowings. The board of directors recommended dividend at 10 per cent for the period under review.

## FOUNDATION STONE FOR TN AROMATICS PLANT TO BE LAID SOON

The foundation stone for long pending aromatics project is to be laid soon, the Tamil Nadu chief minister, Mr. M. Karunanidhi, told the Assembly on August 21. The state had secured an assurance from the Centre for implementing the project, much against the claim of Uttar Pradesh government for promoting a similar plant at Saleempur, he said repyling to the debate on the first supplementary statement of expenditure for the current year.

## CLEARANCE OF DUTY DRAWBACK CLAIMS

Mr. K.P. Singh of the customs office, Shahar airport, has assured FIEO that all applications for duty drawback upto August 11 will be cleared by the 30th of this month. This was revealed by Mr. Ramu Deora, FIEO president. He said the delay has been attributed to shortage of manpower at the airport office.

**EFFLUENT TREATMENT**

# Aid to SSIS in rural areas for setting up common plant

The Union government has initiated a scheme for providing financial assistance to small-scale units in rural areas for setting up common effluent treatment plants. This was disclosed by Mr. Nilamani Routray, the Union Minister for Environment and Forests at Delhi on Aug 22, while addressing the members of the consultative committee attached to his Ministry.

This scheme, the Minister said, would be extended to provide necessary technical support as well. While the large and medium industrial units would remain totally responsible for their pollution, subsidies will be provided to small-scale units to aid the implementation of pollution standards, the Minister added.

The consultative committee discussed the draft policy statement (for abatement of pollution) circulated among the members. The policy aims at integrating environmental and economic aspects in development planning, stress preventive aspects in pollution abatement; promote technological inputs for reducing industrial pollutions; and rely upon public co-operation in securing a clean environment.

That policy addresses both the process of minimisation of pollution as well as the level of achievement of pollution control. In this manner the policy distinguishes between the preventive and curative sides of the problems.

Mr. Routray claimed that substantial progress has been achieved in reducing pollution from the major industrial units. Out of 182 highly water-polluting major units of eight industrial categories, 764 have set up or are setting up effluent treatment plants.

Out of the 282 highly air polluting major units of four industrial categories, 200 have or are setting up emission treatment equipment. The unfinished work relates primarily to the old units. The draft takes a more flexible and long-term perspective on industrial pollution.

Stressing the need of sharing the responsibility for cleaning environment with other Ministries and State Governments, the Minister said that the various Acts passed till date will not be sufficient to check the problem of pollution unless the Government adopts the carrots and stick policy.

The Ministry, Mr. Routray said, proposed to advice economic instruments which will promote pollution control by making it expensive for industries which pollute.

The Government, the Minister said, has already announced a set of financial incentives to encourage the installation of pollution control devices. It is also considering introduction of charges on the industries based on their pollution level.

The Government intends to gradually progress towards such monitoring by compelling the industries to install more automatic monitoring by strengthening the State pollution control boards.

Expressing concern about pollution caused by the municipal wates, the Minister highlighted the necessity of adopting a comprehensive approach to prevent the pollution of rivers, lakes and other water bodies from point and non-point sources of pollution. Schemes for supply of drinking water should also be made an integral component of disposal of waste water and sewage treatment.

Informing the members about the targets set by the Ministry for control of pollution in specific major indust and highly polluted areas identifie each State, Mr. Routray said that Government aims at seeking a cons sus in society by integrating envir mental concerns in decision makin all levels, by including environme audit in the annual administrat reports of sector Ministries and S Governments.

The Government, the Minister s was negotiating with the World Ba for assistance of about Rs. 500 cror which will be available to indus through the financial institutions, a will strengthen four State pollution co trol boards — Gujarat, Maharasht Tamil Nadu and Uttar Pradesh.

---

## PARADIP PHOSPHATES' PLAN ALMOST COMPLETE

The second phase of construction the Rs. 630-crore Paradip Phosphat Ltd. (PPL) would be completed befo the end of the current financial year, general manager M.T. Raza, said.

The plant, a joint venture of India an the island republic of Narau, has a installed capacity for the production 7,20,000 tonnes of diammonium pho phates. India holds 51 per cent of th company's equity shares and Naurau 4 per cent, the total value of which Rs. 120 crores.

Claimed to be the most sophisticate and largest of its kind in Asia, the plan attained 87.5 per cent capacity utilisa tion in 1989-90, despite a three-mont closure due to delay in arrivals o imported raw materials.

With the completion of the secon phase of construction, the PPL woul provide employment to 200 more persons, in addition to the 750 employees already in its rolls. Mr. Raza said tha while providing employment, preference would be given to people displaced from their lands for the establishment of the project.

**ATTENTION ▶ END USERS, EXPORTERS**

YOUR SEARCH FOR THE BEST QUALITY **OXALIC ACID** ENDS HERE!

**OVER 99% PURITY**

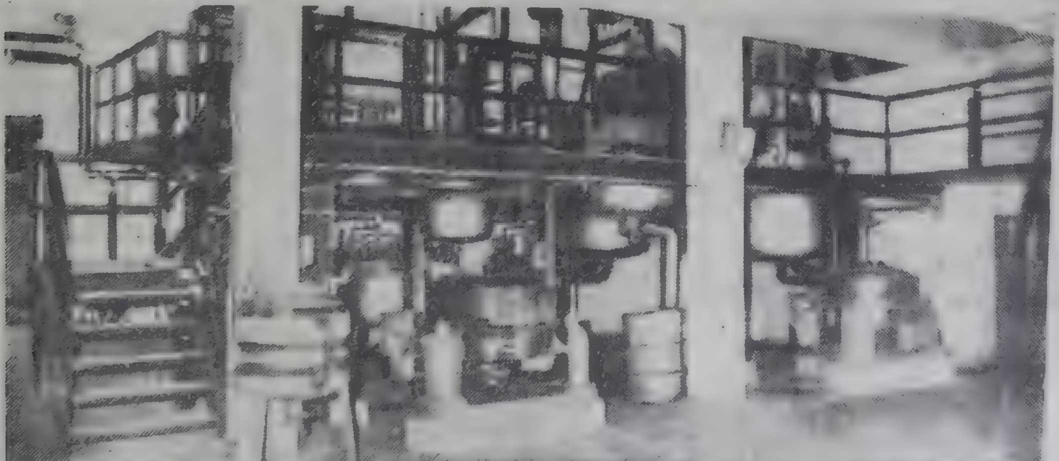
*Paschim Chemicals Pvt. Ltd.*

**Admn Office:**
402, Chartered House. 293/299
Dr. Cawasji Hormasji Street,
Marine Lines Bombay-400 002.
Tel 253421, 297158.

**Regd. Off:**
524, Cotton Exchange
Kalbadevi Road
Bombay 400 002
Tel: 314637

**MAG**

*Reputed Manufacturers of*
PLANT & MACHINERY for PHARMACEUTICAL CHEMICAL, and OTHER INDUSTRIES.



For further particulars please contact :

**MAG ENGINEERING WORKS (INDIA)**
2/A, VAIBHAV INDUSTRIAL ESTATE, NEAR L & T, POWAI,
SAKI VIHAR ROAD, BOMBAY - 400 072. PHONES : 6326149, 6328138, 6320674

READILY AVAILABLE FROM DEPOT AT DOMBIVLI AND BOMBAY

**'NPL' HYDROGEN PEROXIDE 50%**

MFG. BY NATIONAL PEROXIDE LTD.

**"PDI" ACRON PIGMENTS/BINDERS/PIDIVYLS/PIDINONS**

Authorised Distributors

**DHANLAXMI CHEMICALS**

**PAREKH DYES AND CHEMICALS**

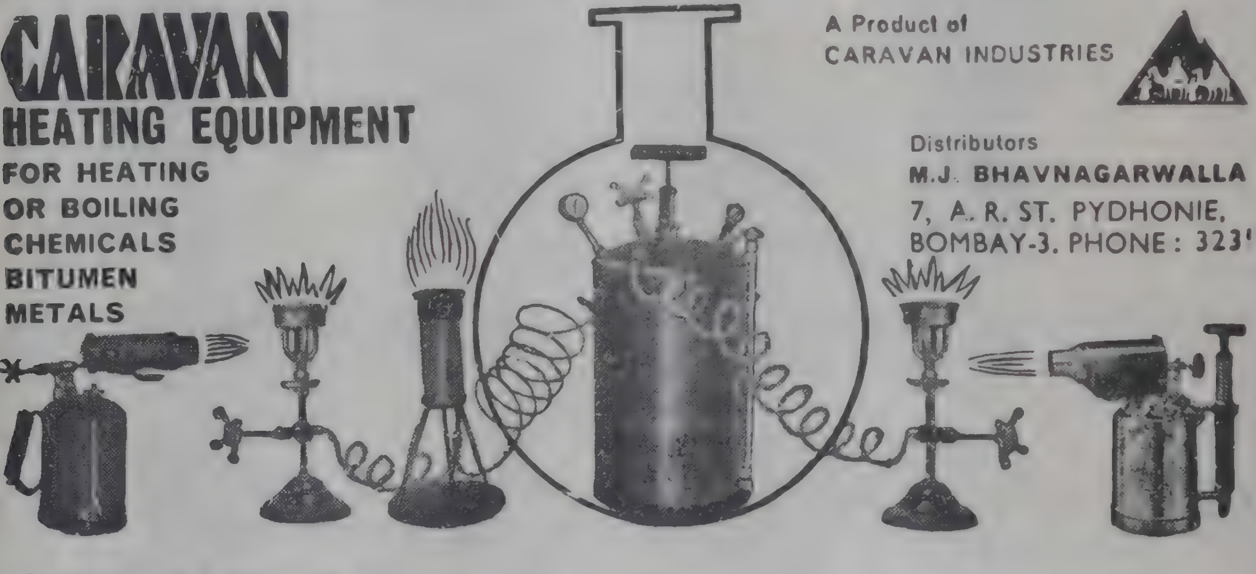
General Assurance Building, 3rd Floor, 232, Dr. D.N. Road, Bombay 400 001.
Phone: 2045154/2042398, Dombivli - 5687

---

**CARAVAN**

**HEATING EQUIPMENT**

FOR HEATING
OR BOILING
CHEMICALS
BITUMEN
METALS



A Product of
CARAVAN INDUSTRIES

Distributors
**M.J. BHAVNAGARWALLA**
7, A. R. ST. PYDHONIE,
BOMBAY-3. PHONE : 323'52

ALSO AVAILABLE DIESEL FIRED "BHATTIS"

---

AVAILABLE EX-STOCK

- Para Hydroxy Phenyl Acetamide
- Atenolol
- Mebendazole
- Chlorpheniramine Maleate
- Frusemide
- Ortho Nitro Benzaldehyde
- Nifedipine
- Diclofenac Sodium
- 2-Chloro 5-Nitro Aniline

Please Contact Manufacturer:

**M/s. RADIANT PHARMACEUTICALS PVT. LTD**

F-14, Sector 7 Market, Vashi, New Bombay 400 703.
Tel.: 0215-662019

# Karnataka Antibiotics exports rise

The Karnataka Antibiotics and Phar-
ceuticals Ltd., registered major
wth on the exports front during the
r 1989-90 with a 147 per cent jump
sales over the previous year.

Pharmaceutical products exported to
intries like West Germany, Denmark,
, Belgium and Afghanistan fetched
joint sector company Rs. 99 lakhs
ing the financial year in hard cur-
cy as against Rs. 40 lakhs in
38-89.

Addressing newsmen on Aug 23, at
ngalore, Mr. P.P. Madappa, manag-
director said that KAPL had also
reased the value of production during
year from Rs. 1625 lakhs previously
Rs. 1957 lakhs, a growth of 20 per
nt. While the increase in sales turn-
er for the year was small Mr.
adappa said the company had man-
ed to record a modest profit for the
th year in succession. During the year KAPL earned a pre-tax profit of Rs. 13 lakhs as compared to Rs. 22.50 lakhs in '88-89.

According to Mr. Madappa the highlight of the sales during the year was the successful marketing of products with higher contributions. This strategy he said had helped compensate the increase in various inputs and administrative costs.

Another highlight, he said, was the increase in sales of animal health products manufactured by KAPL from Rs. 16.80 lakhs to Rs. 56 lakhs in 1989-90.

As part of its diversification efforts the company has obtained permission from the Drugs Controller of India for importing and marketing over 20 different immuno-diagnostic kits, including kits for detecting AIDS. Mr. Madappa said that the company is exploring the possibility of manufacturing and marketing non-radioactive malaria detection probes for the first time in the country.

The biggest achievement in the diversification bid according to him was the successful completion of large scale validation of the animal birth control injection called TALSUR and grant of approval from the Drugs Controller of India for the manufacturing and marketing of the product.

## PRICES OF RANBAXY DRUG CUT

The Government has cut prices of doxycycline, a drug mainly produced by Ranbaxy Laboratories, from Rs. 5,436 to Rs. 4,968 per kg. The cut is on an interim basis as Bureau of Industrial Costs and Prices (BICP) is in the midst of a fresh cost study.

The drug is in Category 2 and is considered an essential item.

XTRA PURE EXTRA WHITE
GUANIDINE NITRATE

- Import Substitute
- Quality product for pharmaceutical and explosive industries.
- Prompt delivery.
- Competitive rates.
- Export enquiries solicited.

NECTAR
R●DUCTS

Factory : 620 GIDC Phase IV,
Naroda, Ahmedabad 382 330.
Phone : 813289/403417.

Office : 53, Chetan Cloth Market,
Outside Sarangpur Gate, Sarangpur,
Ahmedabad 380 001
Phone : 346581, Gram : NECTAR Ahmedabad

# Crude supply: Malaysia comes to India's rescue

Malaysia has agreed to supply 7,50,000 tonnes of crude to India from October this year to overcome the oil shortage resulting from the Gulf crisis. Mr. Prakash Shah, Additional Secretary in the Ministry of External Affairs, said on August 22 at Kuala Lumpur.

India will face a shortfall of 2.4 million tonnes between August and October as a result of the sanctions imposed by the United Nations on imports from Iraq and Kuwait, India's traditional suppliers of crude.

It has been in touch with OPEC and non-OPEC countries which have expressed their readiness to increase output to meet worldwide shortage resulting from the Gulf crisis.

India already has an on-going term contract with Malaysia for supply of half-a-million tonnes of crude from April 1 this year.

The two countries had signed a memorandum of understanding providing for an additional supply of half a million tonnes beginning October on contract basis following discussions held at Kuala Lumpur by an Indian delegation led by Mr. Prakash Shah. Mr. Shah said the price for the crude will be the official selling price in the maket.

Malaysia has also indicated its willingness to reserve another 2,50,000 tonnes or 5,000 barrels per day beginning October to be supplied within one year on spot basis.

Mr. Shah, who held talks with the petroleum company of Malaysia's 'Petronas', the Foreign Ministry and the Prime Ministers office, thanked Malaysia for the timely help in meeting India's needs of crude petroleum. It is the outcome of the long standing friendly relations between the two countries, Mr. Shah said. He said he also discussed the possibility of supply of middle distillates from Malaysia but a final decision was yet to be taken by the Malaysian side on the matter.

India has also agreed to meet Malaysia's urgent requirements of naphtha between October and September this year. Twelve cargo loads of onaphtha will be shipped to Malaysia during this period. The agreement on oil for naphtha was made possible as a result of intensive discussions held during the past three days.

Mr. Shah said other members of the Indian delegation will leave for Indonesia for similar talks on supply of crude oil to meet India's requirement. Malaysia has decided to step up oil production by 10,000 barrels a day to meet the demands of countries dependent on Iraqi and Kuwaiti oil. It currently produces about six lakh barrels of crude per day.

## OPEC MAY HIKE OIL OUTPUT

Asia's only Opec member, Indonesia, said that members of the organisation will take measures to ensure adequate supplies of oil in view of the UN embargo on oil exports from Iraq and Kuwait.

Indonesia's energy minister Ginandjar Kartasamita said his country has assured supply of oil to the Philippines and other developing countries dependent on supplies from Iraq and Kuwait.

Mr. Ginandjar said most Opec countries have agreed that the world should use stockpiled oil instead of pressing the producing countries to increase output. He believed world commercial stocks are large enough to offset the drop in Opec output for the next eighty days.

Another oil producing country in the region, Malaysia, decided to increase its
oil production oby 10,000 ba
day. Mr. Ginandjar said Indon
raised the export prices of its
mark Minas crude oil from it
level of $14.81 a barrel last m
$19.19 this month. He predi
price would surge further du
prevailing situation in the Gulf

Indonesia currently export
700,000 barrels per day of cr
mostly to Japan, from its presen
of 1.37 million BPD set by Op
Iraq invasion of Kuwait earl
month caused oil price to soa
international market to more th
a barrel against the cartel's targ
of $21 a barrel. Venezuela an
Arabia have asked for an em
meeting of Opec to discuss a p
increase in production. At its m
ial meeting in Geneva last
OPEC agreed to a new ceiling
crude oil production of 22.5
BBD.

## NO PETRO-GOODS PRICE HIKE NOW

The Union Government has n
to raise the prices of petroleum p
despite the present situation in th
and the recent price hike by the
isation of Petroleum Exporting
tries (OPEC), the Ministe
Petroleum and Chemicals, Mr.
Gurupadaswamy told the Rajya
The Minister, however, declined
an assurance to the House that
would be no increase in prices f
year.

Mr. Gurupadaswamy said
although the price of oil had bee
cially hiked by OPEC to $21 per
the current prices of the produc
the Gulf were ruling higher at
per barrel. The Finance Minist
said, had permitted a sum of
Rs. 800 crores for this purpose
current year and in view of this f
urged upon the public and the p
sector to co-operate with the G
ment in this regard.

FOR YOUR REQUIREMENTS OF QUALITY PRODUCTS

**PHENYLBUTAZONE I.P. OXYPHENBUTAZONE I.P.**

**TRIMETHOPRIM I.P.**

**& Intermediates**

**HYDRAZOBENZENE**

**DIETHYL MALONATE**

Contact Manufacturers:

**REINE CHEMICALS**

P.O. Box No. 6, GANDEVI - 396 360
**Phone: 363/393/563**

*For MAHARASHTRA Contact:*
M/s. KHOKHANI ASSOCIATES, 3rd Floor, Keshav Baug, 116, Princess Street, Bombay 400 002. Phones: 252244/252688

---

**Attention - Exporters & Local Users**

**TEREPHTHELALDEHYDE**

Please Contact Manufacturers

**Bright-O-Chem**

Plot No. 3917, GIDC, Ankleshwar 393 002.
**Phone: 2733**

---

For Your Requirements of:

**ORTHO CYANO TOLUENE 99%**

**4 NITRO 2 AMINO PHENOL**

**OPTICAL WHITENING AGENT**

Contact Manufacturer

**MAHENDRA DYES & CHEMICALS P. LTD.**

136/1-2, GIDC Industrial Estate, Vapi, Gujarat.

*Office:* Hari Building, 2nd Floor, 58/64, Shaheed Bhagat Singh Road, Bombay 400 023.
**Phone: 2864510; Cable: PEEGABO, Bombay; Telex: 011-6338 MBPG IN**

AVAILABLE FROM READY STOCKS
WITH MODVAT BENEFIT

- CHLOROFORM
- CELLOSOLVE
- CARBITOL
- D.B.P.
- ISOPHORONE
- LACTIC ACID
- M.E.K.
- PROPIONIC ACID
- PERCHLOROETHYLENE
- PROPIONIC ANHYDRIDE
- SODIUM FORMATE
- TRIETHYLENE GLYCOL
- TUNG OIL

Contact:

**M/s. PARESH CHEMICAL CORPORATION**

3/25, Steelyard House, 67-F, Sant Tukaram Road, Bombay 400 009.
Phone: 324500, 325014/5/6/7; Resi.: 395245, 378425

**DYEACTIVE** A- TRUSTED NAME **DYEAZOL**

**BRAND REACTIVE DYES**

Manufacturers & Exporters

**DYE-CHEM & ALLIED PRODUCTS**

DAP

5, 1st FLOOR, ELLORA COMMERCIAL CENTRE
NEAR RELIEF CINEMA, AHMEDABAD 380 001.
PHONE : OFFI. 352713, RESI.: 332349

**EXPORTERS' INQUIRIES SOLICITED**

(KNS-AD

FOR YOUR REGULAR REQUIREMENTS AND EXPORT

*** DYES:**
(NAPHTHOLS, RED TR BASE, RED KB BASE, SALTS, RAPIDOGENS)

*** INTERMEDIATES:**
META NITRO ANILINE (MNA)
META DI-NITRO BENZENE (M-DNB)

CONTACT:
**DALAL ENTERPRISE**

- ANTHRAQUINONE
- ORTHO BENZYL BENZOIC ACID (OBB)
- BENZANTHRONE

CONTACT:
**PHOENIX PETROCHEMICALS PVT. LTD**

*FACTORY:* PLOT NO. 7, G.I.D.C. ESTATE, NARODA, AHMEDABAD 382 330, INDIA
*OFFICE:* SHANTIKUNJ, PALDI, AHMEDABAD 380 006, INDIA.
Telephone: (O) 78520, 76042; (F) 811519, 810305
Telex: 0121-7071 RAVI-IN * Fax: 272-411148

We also invite interested parties for area distributorship

# Highlights in Chemical Technology (Part 1)

## IOTOSENSITIVE CHEMICALS A NEW ADVANCE IN CHEMI- L TECHNOLOGY

Photosensitive chemicals that can be eatedly cycled from colorless to col- d by irradiation with light are being nmercialized by the UK company ıqmark* Systems.

The materials have been developed in laboration with Prof Heller of Univ. Wales and have won the 1990 Award new products based on a recent sci- tific advance. The chemical changes m colorless to colored when exposed light of a particular wavelength and ı be made colorless again by irradi- on with light of a different wave- gth. Yellow, green blue, purple and l shades are possible.

The Company sees a range of uses t the nearest to realization is in secur- marking inks to foil counterfeiters. e company has developed a way of orporating the photosensitive mater- s into a microscopic polymer beads t are then used, as a pigment. The ulting inks can be applied conven- nally. Besides bank notes and credit ds, there are also opportunities for with products such as pharmaceut- ls perfumes, video tapes and compact cs.

The Company believes the materials o have a very real potential for pro- ling the basis for an erasable com- ct disc that could be compatible with sting playback systems. The mater- s behave as 'light switches', so they o have the potential to be used as nsistors in very high speed optical nputers, and in routing high signals m optical fibres. As a thin film, the terials are being developed as the sis for a new type of monochromatic aging system.

Engmark is now looking to link with a larger chemical company to develop the product potential. The Company will also consider licensing the technology.(*ECN*, 6/25/90, p. 20).

## JAPANESE COMPANY DEVELOPS EXOTHERMIC PAINT WITH NOVEL POTENTIAL APPLICATIONS

A Japanese company Rustol Chemical has recently developed an exothermic paint and has begun its commercialization, The company has also started negotiations on technology transfer and first venture project in Europe.

The Company has reported little about the composition of the paint, which has not been patented, except that it is an organic material and that the heating is not based on resistance or chemical effects. However, Rustol is making great claims for the coating made with the paint called MRX 001. It can produce and sustain temperature from 1°C to 1000 °C with low levels of energy consumption. A 6V potential is needed to produce 30°C temperature, while 100V will give 800°C. Further, because it is a viscous fluid, it can be applied by brush or spray to any shape or complex surface.

Uses are claimed to be widespread from space heating to de-icing of runways, from process pipe heating to cooking and even textiles. In Japan, Rustol has carried out trials with an underfloor heating system for a car park. Over a 4 month winter period in Hokkaido, the company reports, a conventional snow melt system covering 1000 $m^2$ costs $24360 to run, whereas the MRX 001 heating area costs only $7400. Heat output was 76W/$M^2$ in the MRX 001 area.

The Company has identified over 200 potential applications and wants to set up joint ventures with companies to exploit the technology in each of them separately, tailoring the coating to the particular uses. (*ECN*, 6/25/90, p. 20).

## RECYCLING LEATHER WASTE — A NEW PROCESS PROVIDES MULTIPLE BENEFITS

A new process that separates chromium from solid leather waste not only saves a tannery money by recovering chromium and eliminating the need for landfilling, but it also produces a protein that could be used as a fertilizer, in animal feed additives or as a cosmetic ingredient. This patent pending process was developed by scientists at the US Dept. of Agriculture's research centre at Philadelphia.

Chromium is applied to animal hides in the form of chromium sulfate, which stabilizes and preserves the hide. To remove the chromium, leather shavings are suspended in water with alkali (pH 9.00-10.5) and heated to 140-145°F for about an hour. A bacterial enzyme is added and the mixture is held at the same temperature for 2 more hours. A chemical reaction yields protein solution, containing a suspension of chromium, the latter is recovered by filtration or centrifugation. The cake can be chemically treated to recover chrome pure enough for use in various industrial applications. (*Chem Eng*., 6/1990, p. 11).

## RECORD RECYCLING OF ALUMINIUM IN USA.

In USA some 17.1 billion aluminium cans were collected for recycling in 1989 by Alcoa. Can collectors earned $232 million for themselves by returning the cans to one of the 2400 centres in Alcoa's national can recycling network. According to Alcoa used cans weighed 611 million lbs, an amount greater than the annual production of an average sized Al smelting plant. The used cans are remelted, rolled into new Alcen sheet and sold to can makers. Often closing the loop between use and re-use in as few as 90 days. This record can harvest was prompted by increased public participation and growing commitment to recycling by brewers, soft drink bottlers, can companies, supermarkets and others. Alco and other companies in the Al industry in 1989 recycled a record 49 billion beverage cans for which consumers earned an estimated $900 million. Nearly 61% of the 80 billion alumium beverage cans produced in USA in 1989 were recycled. This is a record increase from 1988 when 55% of 78 billion Al cans were recycled. 'To an enlightened public in USA recycling has become the right thing to do for many very good reasons', reports George Cobb, Alcoa's president. 'And as the markets for Al beverage and food cans continue to grow, used cans will become even more valuable as an above ground 'aluminium mine' for producing the metal for new cans with great savings in energy costs'. (*CMR*, 4/30/90, p. 22).

## VERNONIA OIL FINDS USE IN PAINT INDUSTRY

Paint researchers in USA have developed a good use for a plant origin oil obtained from the seed of an African plant, Vernonia galamensis. The oil called Vernonia oil can be used as a binder in paints. Synthetic binders that flow easily exist but they are expensive to produce. Vernonia oil is cheap and it is chemically similar to linseed oil, which has been used as a binder in paints since the Middle Ages. However, unlike linseed oil, which is viscous at 10°C, Vernonia oil flows easily even at temperature 0°C. Recently, research chemists in paint industry, have found the using Vernonia oil, paints need only half the usual amount of volatile solvents, which pollute the environment. Further, the paints harden quicker, when Vernonia oil is employed as a binder. However, the chemistry behind the action of Vernonia is still not clarified. The use of Vernonia oil can reduce air pollution from volatile paint solvents and therefore will be encouraged in future. (*New Sc.*, 5/21/90, p. 50).

## RECENT TECHNOLOGICAL INNOVATIONS AT DU PONT & MONSANTO TO REDUCE AIR POLLUTION

Recently, some innovative but simple technological modifications have been reported from Du Pont and Monsanto companies in USA. These companies have found that simple adjustments to processes that have been standard for decades can lower emissions of volatile chemicals and even increase yields at times. For instance, by changing the temperature and pressures in a reaction to produce adipic acid, a chemical used in the manufacture of nylon, Du Pont halved emissions of cyclohexane, propane and butane and increased yield by up to 1%. In another direction, Monsanto engineers on examining every phase of their manufacturing processes to reduce air-pollution developed an ingenious innovation in their manufacturing process for mothballs. They found that a change of solvent from perchloroethylene to isopropyl biphenyl, which is one-tenth as volatile, reduced loss of volatile solvent. This not only reduced cost of production of mothballs, but also reduced air pollution. (*New Sc.*, 5/26/90, p. 57).

## SUMITOMO'S BREAKTHROUGH IN SUPERCONDUCTIVITY

Sumitomo (Japan) claims to have overcome one of the main barriers to bring ceramic superconductors into everyday life. Research at Sumitomo Electric Industries reported last May they had made an experimental coil from a superconductor and created a magnetic field by running electric current through it. Superconducting coils would enable engineers to develop much more efficient electric motors and generators. But making them from the new generation of superconductors discovered in 1986, has turned out t very difficult. The materials are cult to fabricate and lose their super ductivity in a magnetic field. Sumit which has one of the world's larges lections of superconductivity pat claims to have solved the problem a material based on bismuth(Bi). coil, cooled in liquid nitrogen (-19 produces a magnetic field of 0. teslas. (*New Sc.*, 5/26/90, p. 24).

## TAFA RESEARCHERS DEVEL A NEW PROCESS TO GROW I MONDS

Tafa Inc (Concord, N. H. USA) developed a new process to manufac diamonds. The firm's research has underway for over a year and use induction plasma generator that duces temperatures of roughly 14,0 These gases — methane, hydrogen argon — are fed into the high tem ature induction plasma furnace. methane breaks apart into carbon hydrogen and the carbon atoms settl a temperature-controlled deposi plate. These seed atoms are joine trillions of other carbon atoms and g into diamonds.

The largest diamonds the firm thus far produced are about 50 micr in diameter, roughly the diameter human hair. The firm reports it is trying to make gems but seeks to duce industrial-grade diamond coat for wear-resistant and electronic ap cations.

The firm concedes further researc needed to perfect the process but cla it is already 100-times faster than a r microwave method, and the diamo are of consistent quality and free of e tron contaminations. (*CMR*, 5/14/9 24).

## A NEW BREAKTHROUGH DO TO THE WIRE IN SUPERCO DUCTIVE TECHNOLOGY

Flexible

ure superconductors could lead to such gical applications as superconducting otors, but making such wires is dif- ult. Now researchers at Georgia Insti- e of Technology (Atlanta, Georgia), ve developed a technique that will able them to coat fibres with super- nducting materials and then to bundle ose fibres into wires.

Researcher, W. Jack Lackey and his lleagues have put a new spin on a mmon coating technique: Chemical por deposition CVD. In conventional VD, a substance is heated until it comes a vapor; the gas then flows into other chamber and condenses onto a bstrate.

Because reagents for superconduct- g materials made of the elements rium, barium and copper have low por pressure, they travel slowly into e substrate chamber, resulting in depo- ion rates of only about 1 micrometer r hour. The CVD process is also cky for superconductors because each terial must be vaporized separately d then released into the chamber gether.

This requires workers to control nultaneously the pressure, tempera- e and flow rate of three gases.

After months of research with CVD, ckey had an insight: why not aban- n vapors in favour of powder? By nding the three constituents finely d then mixing them in specific pro- rtions with argon gas, the research- created an efficient transport system conveying the materials into the sub- ate chamber. Heating the chamber en vaporizes the powder and so coats e substrate.

The investigators report they have posited high quality layers of super- nducting materials at rates of some 0 micrometers per hour. Although to e the researchers have worked pri- rily with flat substrates, Lackey has signed a CVD system with pulleys that may make it possible to coat lengths of fibres as they are pulled through the device.

Lackey reports that early samples have carried currents as high as 40,000 amperes per sq. cm., enough for some applications. The researchers at Georgia Tech now hope to create long wires that will carry high currents. If they are successful American Magnetics Inc (Oak Ridge, Tenn, USA), will employ the wires in a prototype magnet. (*Sc American*, 3/1990, pp. 14-15).

## CT SCANNING EMPLOYED TO PRODUCE BETTER & SMALLER HIGH INTENSITY HALIDE LAMPS

American industrial scientists have found a new use for a scanning technique normally used in medical diagnosis. This scanning technique called computerized tomography scanning (CT scanning) produce images of 'slices' of the body is helping researchers to look at the hot gases inside halide light bulbs. The aim is to improve the bulbs efficiency and design smaller lamps than are possible at present.

Researchers GTE Laboratories (Waltham, Mass.) are producing three dimensional images of the interior of high intensity metal halide lamp, which are now used to illuminate large areas like car parks in USA. These bulbs are similar to the mercury and sodium vapor lamps that have been used for years to light motorways and other outdoor areas. Rather then passing an electric current through a filament, which glows hot as in a normal domestic bulb, these lamps generate electric arcs which exhale the gas in the bulb and make it glow.

While the gas inside a mercury vapour lamp is at a pressure of 1 atmosphere, in high intensity lamps the pressure ranges from 2 to 8 atmospheres, reports GTE. By studying the heat distribution inside them, the researchers hope to design lamps that could one day be used in cars and homes. The temperature is higher in these high intensity lamps than in ordinary mercury vapour lamps. It may reach 6000°C, near the tip of the electrode. Adding very small amounts of sodium iodide and scandium iodide to the mercury causes these lamps to produce a much 'whiter' light than vapour lamps, making the colours in the areas they illuminate appear more natural.

The high intensity lamps are more efficient than mercury or sodium vapor lamps. They also have long dives, between 10,000 and 25,000 hours compared to only 800 hours for a common incandescent bulb. But explain researchers, these lamps have hot spots and cold spots, while researchers would prefer uniform distribution of temperature for heat efficiency. It was difficult in the past to locate these hot and cold spots, but now using a CT scanner that is located around the lamp, the scientists are able to measure the light emitted from each part of the bulb.

A medical CT scanner rotates around the patient and a beam of x-rays is directed into a narrow 'slice' of the body. The intensity of rays which passes through is measured. The scanner takes a number of images of different slices of the body and a computer, generates a three dimentional image of the body's interior.

The GTE scanner does not use x-rays. It simply rotates around the lamp and a photon detector tube measures all the light emitted from the interior. The data from the scanner is converted by a mini-supercomputer into a three dimensional 'temperature map' of the lamp. The data can also be transferred to a computer model that the scientists will use to design future lamps. In the past it has been easier to design larger lamps. Out now the researchers are moving towards smaller wattage high intensity metal halide lamps for indoor residental use. (*New Sc.*, 4/21/90, p. 31)

*SEEKING ALMIGHTY'S BLESSINGS*

ESTABLISHED ON 2ND SEPTEMBER 1953

ENTERING INTO 38TH YEAR

SINCERE THANKS TO ONE AND ALL THROUGHOUT INDUSTRIES AND TRADE FOR THEIR CO-OPERATION AND INSPIRATION.

WE PLEDGE OUR WORLD CLASS ALLROUND EFFORTS FOR EVER BETTER PERFORMANCE FOR AND ON BEHALF OF WORLD RENOWNED WORLD CLASS OVERSEAS PRODUCERS' PRINCIPALS

**AMPI AGENCIES PRIVATE LIMITED**

SUCCESSORS TO

**MORLIDHAR PREMCHAND & CO.**

HEAD OFFICE : BOMBAY
BRANCHES : CALCUTTA & NEW DELHI
LIAISON REPRESENTATIVE OFFICES: BANGALORE, HYDERABAD, MADRAS, LUCKNOW

**"INTERNATIONALLY ACCREDITED AGENCY HOUSE SERVING SINCE 1953"**

***We Offer***

**ACETIC ACID GLACIAL 99%**

**in Tanker & 35 kg. Carboys**

**OXALIC ACID 98.5%**

Please Contact:

**KWALITY ENTERPRISE**

*Admn. Office:*
215, Bezzola Complex, Sion-Trombay Road, Chembur, Bombay 400 071.
**Phones: 529693 / 523385**
**Gram: NITRICHEMI**

FOR YOUR REGULAR REQUIREMENTS OF:

**GLYCINE PURE/USP**
**HIPPURIC ACID**
**CALAMINE POWDER IP/BP**
**AMMONIUM CARBONATE**
**AMMONIUM CHLORIDE**

Please Contact Manufacturers

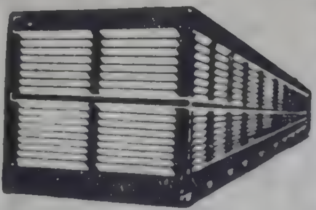
**M/s. FREZCO CORPORATION**

Shanti Nivas, 8th Road, Khar,
Bombay 400 052.
**Phone: Office: 6322847; Resi.: 6493549, 6484131**
**Telex: 011-79303 FC-IN**

A LEADING MFG. OF
FRP & WOODEN.

COOLING TOWERS

WOODEN VAT,&
FILTER PRESS.



**VARUN engineers**

77/9 Phase-I, G.I D.C., Vatva,
Ahmedabad-382 445
Phone: (F) 832204, 832205
(R) 367205, 334335

**V.V.Trans Investments Private Limited**

ANNOUCEMENT

EXCELLENCE
THROUGH
QUALITY

**V. V. TRANS**
**Investments**
**Private Limited**

ANNOUNCES
WITH PRIDE
THE COMMISSIONING
OF THEIR PLANT FOR
THE MANUFACTURE OF

**CHLORINATED PARAFFIN WAX**

(HNP / WAX BASED -
DIFFERENT GRADE)

FOR YOUR REQUIREMENTS
DEALERS/ACTUAL USERS
PLEASE CONTACT

**M/s. V.V. TRANS**
**INVESTMENT**
**PRIVATE LIMITED**

R.O. 43/262, New Sankalbagh
Narasinga Rao Pet,
Kurnool -- (A.P.)
**Telephone: 21381**
**Telex: 0815-216**

FOR YOUR REQUIREMENTS OF

**SODIUM CARBOXY METHYL CELLULOSE (C.M.C.)**

**CELLPRO** -- HVB, LVB, MVB, DVB, LSW II, LSH
**CEPOL** -- HV, MV, LV, UV, UUV, DV, DV (SPL), HVP, MVP, LVP, UVP, DVP, DVP (SPL).
**SODIUM ALGINATE** -- MV, MVR, MVR (SPL)
For Soap, Textile, Pharma, Paint & Detergent
**MONOCHLORO ACETIC ACID (MCA)**
**MCCP (SPL)**
**AGAR AGAR (CHINA GRASS)**
**CELLULOSE POWDER -- CP 100, CP-X, CP-60**
**METHYL CHLORO ACETATE (MCA)**
**ETHYL CHLORO ACETATE (ECA)**
**ISO PROPYL CHLORO ACETATE (IPCA)**

Manufactured by:

**CELLULOSE PRODUCTS OF INDIA LTD.**

Also Available: **MCCP** of M/s. OM NEELKANTH CHEMICALS (I) PVT. LTD.

Please Contact: **R.K. CHEMICALS**
308, Samuel Street, Vadgadi, Bombay 400 003
**Tel.: 339208; Resi.: 6051686, 6210271, 6212655**

---

For Your Requirements of:

**NITRO BENZENE**

**as per I.S.I. Specification**
**in Bulk (Tanker Load) and Drum Packing**

*Manufactured by*

**M/s. ABHINISHA INTERMEDIATES (P) LTD.**

*Office:* Narotam Building, Kapasia Bazar, Kalupur, Ahmedabad 380 002.
**Phone: (O) 339668 (R) 468772**

*Works:* Plot No. 1469/1, Near Atlas Organics (P) Ltd., Opp. M. Ravji & Co., Rajpur, Tal. Kadi, Dist. Mehsana.

---

AVAILABLE INDIGENOUSLY

**SELENIUM SULFIDE (U.S.P.)**
**SELENIUM DIOXIDE**
**SODIUM SELENITE**
**SODIUM BISELENITE**
**SELENOUS ACID**

Contact Manufacturers:

**OMKAR CHEMICALS**

*Office:*
23, Vrindavan, Four Bungalows Road,
Andheri (W), Bombay 400 058.
**Phone: 6238996**

*Factory:*
W-92(A), MIDC, Badlapur,
Dist. Thane, Maharashtra - 421 503.

# Science Briefs

## INDIGENOUS TECHNOLOGY FOR CHROMIUM DIOXIDE

Scientists at the National Aeronautical Laboratory (NAL) have developed an indigenous technology for the manufacture of chromium dioxide, suitable for making magnetic recording tapes for audio, video, instrumentation and computer applications.

Micropulverised chromium dioxide is also used in making magnetic seals for high speed rotating systems. Coarse grade chromium dioxide finds application as a polishing medium for obtaining fine finishes on metal parts.

The indigenous process is an improved one over the presently used process as the end product with superior magnetic properties is obtained in a single step from chromium trioxide.

NAL has set up a pilot plant to manufacture chromium dioxide in five kg batches and has produced about 100 kg by now. The samples have been tested by well established names in magnetic tape industry: Magnex of Italy and TDK Japan. The product made by NAL was found to be as good as the commercially available products elsewhere. Further scaling up of the plant in under active consideration.

The annual demand in India today is of the order of 400 tonnes per year, but the figure is likely to go up with spread of tape recorders, VCRs and computers.

Recently International Business Machines (IBM) of the US have introduced small sized chromium dioxide recording tapes which possess a very high storage density when compared to even optical disks.

All the units manufacturing prerecorded audio and video tapes are changing over to chromium dioxide tapes due to their superior performance and long life, compared to the current ferric oxide tapes.

**-- P.T.I. Science Service**
**August 1-15, 1990**

## ANTI-MUTAGENIC PROPERTIES OF TURMERIC

Research at the National Institute of Nutrition, Hyderabad, has confirmed the anti-mutagenic effects to turmeric in humans, reporting that it may act as a preventive against several dietary carcinogens.

Similar anti-cancer properties of turmeric were reported earlier in animals. The NIN studies also indicated that zinc is an important anti-carcinogen, as its deficiency leads to a reduction in the activity of drug-metabolising enzymes, particularly glutatione-s-transferase.

Studies at NIN showed that turmeric, when incorporated at 0.5 per cent in the diet, had significant anti-mutagenic effects against a single dose of benzopyrene. Further studies conducted this year with lower doses of turmeric and different carcinogens in rats confimed these results.

The studies also showed that turmeric was anti-mutagenic against carcinogens like 3-methyl cholanthrene which is known to damage DNA.

Turmeric had considerable toxicity against urinary carcinogens which are excreted by smokers. Experiments with nine normal male volunteers all chronic smokers and between 45 to 60 years of age, showed that when turmeric in doses of 1.5 grams per day was administered in the form of tablets, for 30 days, there was a considerable decrease in the urinary mutagens.

There is also experimental evidence to suggest that turmeric has cholesterolemic and hypoglycaemic effects. Blood samples of smokers who were given turmeric indicated normal levels of glucose, total and high density lipoprotein cholesterol and triglycerides. Turmeric also did not have any toxic or nephrotoxic effects.

**-- P.T.I. Science Service**
**August 1-15, 1990**

## NEW PROCESS TO EXTRACT IRON, ALUMINA FROM LOW-GRADE ORES

A scientist in Maharashtra has evolved a new process to extract iron ore and aluminium hydroxide from low-grade lateritic iron ore efficiently.

In the new process named 'Elgai', each component of the ore is extracted in the form of sponge iron, aluminium hydroxide and silica with negligible quantity of waste in the form of sludge.

It helps exploit iron ore containing less than 68 per cent iron and high alumina, which is difficult to smelt. The invention has fetched the scientist, V.K. Vhatkar, from Kolhapur, a National Research Development Corporation (NRDC) award of Rs. 50,000.

The process which uses a coke breeze and soda ash, is semi-pyrometric and semi-chemical, says Mr. Vhatkar in a report in the journal "Invention Intelligence". The light metals easily react with the alkali while the coke (carbon) reduces the metal oxides. After separation of the light and heavy metal oxides, magnetic action separates the magnetising metals.

As each component, iron, alumina, titania, vanadium, silica and precious metallic oxides are extracted separately, there is no waste, and therefore, no silt and no environmental pollution. The non-magnetic matter is used for recovery of other minerals while the magnetic residue is mainly the reduced iron or contaminated with other magnetic minerals. It is possible to separate the weak and strong magnetic matter using centrifugal magnetic devices.

The magnetic matter is converted into molten metal by reduction with coke firing in a cupola furnace. The ore, sans any alumina, manganese, phosphorus, sulphur or silica impurities, is fit to be smelted in an electric furnace along with petroleum coke or low-ash contained coke.

The process helps to extract high-quality metal from low-grade alumino-ferrous ores which are conventionally left unused. It yields pure alumina and iron oxide with 72 per cent purity.

The magnetic matter is useful for marine pipe coating, and if carbonised below 950 degrees celsius, it gives iron powder which finds use in powder metallurgy. The pure alumina can be directly electro-smelted to obtain aluminium, without any further electrolysis. It can also be used to manufacture alums, precious jewellery stones and abrasive wheels.

**-- P.T.I. Science Service**
**August 1-15, 1990**

## NEW COST-EFFECTIVE SOLAR PUMP

A Hyderabad-based engineer has developed a small solar pump which could prove handy for Indian farmers. Designed to work on a thermodynamic cycle, the solar pump can draw 2000 to 7000 litres of water per hour.

The unique feature of the solar pump is that it is extremely simple and can be manufactured in a small workshop in developing countries, claims its designer, Mr. Kiran Chandwalkar. The pump uses a solar concentrator for collection of heat. It can also be modified to use other waste heats of low magnitude, said Mr. Chandwalker, member of the Hyderabad Science Society.

The solar pump is highly adaptable and can withstand severe field conditions. When produced in large quantities the small solar pump can be a viable option for small farmers even without the support of government subsidies. Mr. Chandwalker said that with proper research and development support, a model for field trials can be developed within two years and mass produced thereafter. The solar pump prototype was displayed at the Hanover fair in May 1990.

**-- P.T.I. Science Service**
**August 1-15, 1990**

## ELISA TEST TO DETECT ANTIGEN IN INTESTINAL AMOEBIASIS

A simple, sensitive and stable enzyme-linked immunosorbent assay (ELISA) has been developed for the detection of copro antigens in intestinal amoebiasis.

Intestinal infections caused by **Entamoeba histolytica** are difficult to diagnose because of diffuse symptoms. Although microscopic examination of the patient's faeces for the presence of the amoeba cysts is reliable enough proof, the efficiency of detection by skilled technicians is reported to be only 10 to 33 per cent. Also, the cysts may or may not be present in the faeces of all the patients.

A team of doctors from the Span Research Centre at Surat, and Centre for Biotechnology, Anna University, Madras, recently attempted to develop a simple, sensitive and economical ELISA test for detection of the copro antigen in the faeces of amoebiasis patients infected with **E histolytica**. The scientists prepared the antigen from **E histolytica** by sonication and immunised rabbits with it to obtain the antibodies.

Their assay could detect copro antigen in all faeces specimens containing intact trophozoites. Only 40 per cent of patients whose stools contained the amoeba cysts showed the presence of the copro antigen, the scientists, Usha Jain, M.T. Patel, P.K. Desai from Span Research Centre, and P. Kalraj from Anna University reported in the ''Ind Journal of Experimental Biology None of the healthy individuals sho ing the presence to trophozoites an per cent of the individuals living endemic areas showed the presence the antigen. The sensitivity of the ass using polyclonal antibodies was co parable with that using monoclo antibodies, the report in the journal sa The reagents used for the test we found to be stable for more than months when stored at 4 degrees celsi

**-- P.T.I. Science Serv**
**August 1-15, 19**

## ESTIMATION OF TANNINS IN JUTE AND ALLIED FIBRES

A simple method for the estimat fo tannins in jute and allied fibres been developed by researchers in C cutta. Tannins are complex polyphen found in a variety of plant tissues are responsible for the colour of jute other vegetable fibres.

An efficient method for extracting estimating the tannin content is requ while studying improvement of col of jute through removal of colour matter. The new method, developed B.S. Ghosh and co-workers from Indian Jute Industries Research As ciation, Calcutta, not only helps in ef cient extraction of tannin, but also off a simple colorimetic procedure to es mate the tannins. They reported th work in the ''Indian Journal of Fib and Textile Research''.

The scientists extracted tannins fr dry fibre simple using aqueous aceto containing hydrochloric acid. The tan was evaporated to dryness and the re due dissolved in hydrochloric acid. T method is improved over the conve tional procedure of extracting tannin cold water or aqueous acetone wh was ineffective in removing the poly enols which were present as insolu metallic complexes. Adding hydro loric acid to the fibres helps to disso the metals as chlorides.

For colorimetric assay the residue as next diluted step-wise with sodium droxide and ammonium molybdate, d the absorbance of a distinct yellow lour at 370 nm recorded and comred against a standard curve represnting tannic acid.

Acid-soluble lignin or lignin monoeric compounds do not interfere in the lorimetic assay, the report says.

--P.T.I. Science Service
August 1-15, 1990

## LOTHES FOR HIGH-RISK RADES

A new flame-resistant cotton fabric r clothes used by industrial workers s been launched by a Swedish-based rn. The material is impregnated with e chemical **Proban** and it is claimed retain its fireproof properties during entire life-span. Not even frequent dustrial washing impairs it, according its manufacturer.

Contrary to other fabrics with similar operties, the clothes can be stored for ong time. Clothes made of it do not rn or melt like those made of synthe- or cotton/polyester materials and the ks of setting fire to clothes during lding or metal work are thus elimied.

The treated fabric complies with rldwide standards. The flameproofed eralls are also claimed to be safe for rgy sufferers. The new range of meproofed outfits has been developed meet recent demands from the elec- power industry, but the company expects to get safety-conscious cusners from the building trade as well from the steel and chemical indus-

-- P.T.I. Science Service
August 1-15, 1990

## WDER PROTECTS CON- ETE FROM DAMPNESS

United States company has developed a new additive for concrete which could cut the maintenance costs of bridges, tunnels and other structures, reports the journal "New Scientist". The process appears to make concrete completely waterproof, and so impervious to most forms of the chemical attack that currently damages many civil engineering structures around the world.

The penetration of harmful chemicals such as chlorides, which are carried in water, is one of the major worries facing civil engineers. Countless road bridges have been severely attacked in this way.

The company says that the new concrete is also resistant to other damaging chemicals, such as sulphates. The concrete would also halt the "concrete cancer" caused by certain types of rock used in concrete making. And because there are none of the usual pores in the concrete, known as voids, it has "terrific freeze-thaw resistance".

The new process centres on a secret pink powder. This is a mixture of compounds, including phosphorus, potassium, manganese and a catalyst, which modifies the concrete. A small amount of the powder added to concrete in a mixer alters the material so that the voids become filled with crystals. The powder formula is so sensitive commercially that even associated patents are "concealed".

Construction engineers and scientists agree that the concrete could have a great potential, but they still need convincing that it will live up to its claims. "If successful it could expand the use of concrete. Theoretically it would work", says a researcher quoted by the journal.

Recent tests have shown that water does not penetrate the new concrete. He says the concrete also retained its other useful characteristics, such as its ability to flow into moulds easily. Optical and electron microscope examination show the concrete to be surprisingly free of continuous voids. Authorities in Florida have already used the concrete to repair the damaged cooling water inlet and outlet at a nuclear power station.

-- P.T.I. Science Service
August 1-15, 1990.

## ELECTRIC DEVICE KILLS GERMS IN WATER

An electrical device made in the United Kingdom for killing harmful microorganisms in water cooling towers, including the bacteria that cause legionnaires' disease, has recently been proved sucessful, reports the journal "New Scientist". The system relies on electrolyte cells. These release a steady flow of metal ions which are toxic to the bacteria in water circulating through the cooling towers.

Cooling towers are components of air conditioning systems that serve a variety of buildings, from hospital and residential tower blocks, to factories and offices. Outbreaks of legionnaires disease (a potentially fatal form of pneumonia) have been traced to contamination of water in cooling towers by a bacterium called **Legionella pneumophila.** The bacteria are present in droplets of mixture which percolate out from the cooling towers and reach rooms and offices in the buildings below.

The electrolyte cells release minute quantities of silver and copper ions which kill bacteria, viruses and algae that might otherwise colonise the circulating water. Analysts measured the speed with which the system killed known populations of harmless waterborne bacteria in cooling water

They recorded a million-fold reduction in organisms within 15 minutes from an initial, abnormally large, population of 300 billion organisms per litre. In one hour, the number of organisms had dipped to 1000 per litre, well within the accepted levels of one million per litre for cooling towers Throughout the eight-week trial, the analysts reported consistently high performance, the journal said.

The system eradicates micro-organisms more cleanly and cheaply than conventional forms of purification with chemical biocides such as chlorine and hypochlorite. These will still allow **L-pneumophila** to colonise pipework in the circulatory system and are themselves corrosive enough to harm air conditioning equipment. The chemicals also evaporate away rapidly, and must be replenished.

The new electrolytic cells can clean up cooling towers of all sizes. The device treats water which circulates continuously from a reservoir at the base of the cooling tower. The ions leach into the passing water from electrodes made from an alloy of silver and copper. An electronic control unit runs the process. The electrodes which slowly wear away need replacing every two years, the journal said.

**-- P.T.I. Science Service**
**August 1-15, 1990.**

## NEW X-RAY SOURCE

Scientists at the Cornell University in the United States have developed an inexpensive x-ray source which works by an entirely different method as compared to synchrotrons. The latter is necessary for chip manufacturers to develop the next generation of computer chips, but the method is extremely costly running into tens of millions of dollars.

According to the Cornell team, the new technique developed by it will prove cheaper and more effective than synchrotrons when applied to chip manufacture, says the journal "New Scientist".

In the manufacturing process, the lines on the chip are made by applying a coating of a light-sensitive chemical known as photoresist on the surface. A pattern is recorded on the surface by exposing parts of the photoresist to light, which chemically changes it.

The remaining parts of the photoresist can then be removed leaving the underlying surface exposed. The exposed areas can then be etched away chemically, leaving behind those parts of the surface protected by photoresist as lines or other components, such as transistors.

In practice, the line width on the surface depends on how finely the lines can be recorded on the photoresist, either by drawing with a laser or by casting shadows through a metal mask. Lines cannot be formed much smaller than the wavelength of light which exposes the photoresist. Current commercial systems use visible or ultraviolet light with wavelength of 0.25 micrometres or more. X-ray wavelength of 0.01 to 0.001 micrometres would allow much smaller lines.

When used in manufacturing chips, the Cornell team's x-pinch source would cast a shadow, through a mask opaque to x-rays, onto the photoresists. This would require a small, intense x-ray source. The x-pinch source emits from a region 0.5 millimetres across. With this brightness a few pulses should be sufficient to expose the photoresist.

**-- P.T.I. Science Service**
**August 1-15, 1990**

## COLD NITROGEN FOR POLISHING

A new polishing system for plastic parts uses very cold nitrogen gas to harden the surface and reduce frictional heat levels, reports the journal "Engineering".

Many cars feature plastic panels, such as bumper systems which are painted to match the metal panels. However, blemishes in the flexible paint finish on plastic parts are difficult to repair as the poor heat conductivity of plastic causes excessive temperatures during polishing, which can create a dull finish. In addition, the flexibility of the part mak
it difficult to work on.

Repairing blemished parts has therefore meant sanding and repainting th
entire workpiece, until a satisfactor
finish is obtained. This laborious process will be eliminated with the development of the new process.

Using cold nitrogen gas allows th
surface to be worked on in the sam
way as a painted metal part. Liqui
nitrogen is heated until it becomes a ga
and is passed via a specially develope
insulated hose to the centre of the polishing disc. The gas emerges at betwee
minus 60 and 80 degrees celsius an
flows between the disc and the pain
surface.

**-- P.T.I. Science Service**
**August 1-15, 1990**

## PLASMA FURNACE TO DESTROY TOXIC WASTES

Australian scientists have developed a compact plasma arc furnace which can destory long-lived toxic wastes efficiently, reports the journal "New Scientist".

The plasma arc furnace destoys toxic chemicals, such as polychlorinated biphenyls (PCBs) and dioxins, almost instantly at temperatures four times as hot as the surface of the Sun. While the concept of using an incandescent electric arc to destroy toxic wastes is not new, the Australian research team has overcome several problems relating to the temperature and stability of the plasma arc.

To destroy complex toxic molecules completely at rates high enough to be efficient, the waste stream must be directed accurately into the core of the arc, where temperatures approach 30,000 Kelvin. But no metal or ceramic nozzle could tolerate prolonged exposure to the arc without melting. The stream of cold wastes also tends to cool the arc, displacing the zone of maximum temperature away from the core in

inpredictable pattern resulting in
mplete combustion.

ne team has developed and patented
stem that guides the waste directly
the axis of the arc, which flows
veen two copper electrodes. The
s are set swirling so that the arc
mes the shape of a ring-shaped
mn and this turbulence ensures a
e even temperature distribution. An
mal magnetic field is applied which
acts with the ionised gases and
s to constrain and maintain the
e of the arc, maximising its tem-
ture.

he team is developing a compact
ma arc furnace with a power of 150
watts that could be installed in any
t generating wastes. Much of the
gy could be recovered from the
aust gases and recycled, either as
tricity or heat.

he intense heat of the exhaust
am and high degree of ionisation in
gases means that the exhaust can be
d to generate electricity by
neto-hydrodynamics. The highly
sed exhaust gases, when passed
ugh a superconducting magnet
ed around the exterior of the
aust, induce a voltage between a
es of paired electrodes. The result-
current after being converted to AC,
d be used to power the plasma arc,
sed for other electrical devices on
premises.

urther down the exhaust, where the
temperature falls below 2000 K, the
e heat can be used to vaporise water
ive a steam turbine, or for process
ing. The team is now working to
yse the ionised gases emerging from
plasma arc furnace, with the idea of
ping and reacting them to form
gn industrially compounds. PCBs,
instance produce chlorine and
rogen that could be reacted to yield
ochloric acid.

-- P.T.I. Science Service
August 1-15, 1990.

Available Best Quality

BARIUM PEROXIDE
STRONTIUM PEROXIDE
SODIUM CYANATE

Contact Manufacturers:

CORROGARD CHEMICALS

34, Dnyan Sagar, R.B.S.K. Bole Marg,
Dadar, Bombay 400 028.

Phones: 4221047/4225489/4309258
Telex: 011-75328 MTNL IN/002
Fax: 4220189 MTNL/002

ATTENTION
EXPORTERS/INDENTORS/ACTUAL USERS
FOR YOUR REGULAR REQUIREMENTS OF:

OXALIC ACID
ORTHO ANISIDINE
FAST RED B BASE
FAST SCARLET R BASE
FAST BORDEAUX G.P. BASE

Please Contact Manufacturers

NANDOSAL INDUSTRIES

Factory:
Plot No. 4806 & 4807,
GIDC,
Ankleshwar 393 002.
Phone: 2882

Office:
7, Dharam Jyot
96, Kazi Sayed Street,
Bombay 400 003.
Phone: 339535

*RISHAB BRAND*

*Natural Chemicals:*

ANETHOLE
EUGENOL
GERANIOL SUPER
ISO-EUGENOL
LINALOL
METHYL CHEVICOL
L-CARVONE

*Essential Oils:*

OIL ANISE - Pharma Grade
OIL CLOVE - Pharma Grade
OIL MENTHA/PEPPERMINT
- Pharma Grade
OIL MENTHA PIPERITA
- Tooth-Paste Grade
OIL SPEARMINT
- Tooth-Paste Grade
OIL LAVENDER 40/42%
- Perfumer Grade
OIL PATCHOULI
- Perfumer Grade
OIL GERANIUM D.B.

*Resinoids:*

GALBANUM
LABDANUM
OAKMOSS
OLIBANUM

AND

**Special Perfumery Compounds**

Please Contact Manufacturer:

**RISHABH**

G-22, Lawrence Road,
NEW DELHI - 110 035

*Phones*
Factory: 7113922
Residence: 530836

NOW READILY AVAILABLE FROM READY STOC

**TRI ETHANOLAMINE**
**DI ETHANOLAMINE**
**MONO ETHANOLAMIN**

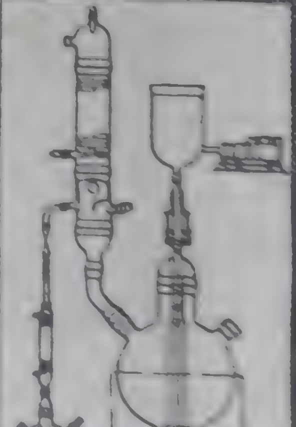
Manufactured by
**P.K. Velu & Co. (Pte) Ltd.**

Contact Authorised Stockist
FOR MAHARASHTRA AND SOUTH

**ATUL CHEMICALS**

*Sales Office* 63/B, Princess Street, Devkaran Mansion, 2nd Fl
Bombay 400 002.
**Telephone: 319510/316366; Resi.: 8227125**

**MANUFACTURERS OF INDUSTRIAL & LABORATORIES GLASSWARES**



Specialists in
- 10 L To 200 L ALL GLASS REACTION & DISTILATION UNITS
- H.C.L. ABSORBERS UP TO 12" DIAMETER
- GLASS HEAT EXCHANGERS, COLUMNS, BENDS REDUCERS, REFLUXRATION HEADS UP TO 12" DIAMETER
- TEFLON VALVES & GLASS STOP COCKS
- COMPLETE STRUCTURE ERECTION & INSTALLATION OF GLASS UNITS
- LABORATORY INTERCHANGEABLE GLASS APPARTUS
- OIL BATH & WATER BATH WITH LEAK PROOF
- BOTTOM SEAL ARRANGEMENTS
- CENTRIFUGAL PUMPS

**GARG LAB GLASS INDUSTRIES**

[illegible]
19, ANAND BHAWAN, 2ND [illegible] BABU [illegible] PRINCESS STREET, BOMBAY-40
[illegible] VAP
Factory:
1 C1B TYPE, G.I.D.C., [illegible] DIST VALSAD (GUJARAT) PHONE 765 – RES

**Offers are invited for following raw materials available with us for disposal**

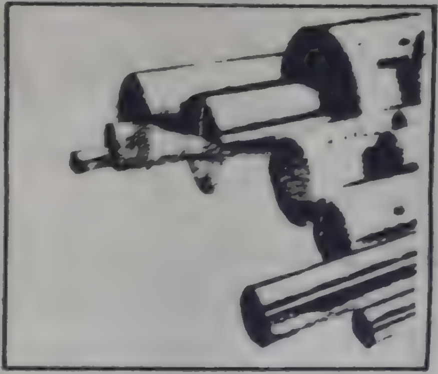
| Sl. No. | Name of the material | Quantity |
|---|---|---|
| 1. | Aluminium Chloride (Anhydrous) | 170 kgs. |
| 2. | Chloropropionic Acid (made in U.K.) | 244 kgs. |
| 3. | Isobutyl Benzene | 175 kgs. |
| 4. | Para Toluene Sulphonic Acid | 49 kgs. |
| 5. | Paraformaldehyde | 25 kgs. |
| 6. | Neopentyl Glycol | 175 kgs. |
| 7. | Monochloro Acetone | 150 kgs. |
| 8. | Sodium Methoxide (Imported) W. Germany | 7000 kgs. |
| 9. | Benzene | 6500 Lts. |
| 10. | Ethyl Bromide | 3250 kgs. |
| 11. | Methyl Formate | 1520 kgs. |
| 12. | 4-Hydroxy Propiophenone | 150 kgs. |
| 13. | Monomethylamine | 200 kgs. |
| 14. | Thionyl Chloride | 292 kgs. |
| 15. | Zinc Oxide | 125 kgs. |
| 16. | Succinimide | 145 kgs. |
| 17. | Potassium Carbonate | 455 kgs. |
| 18. | Ortho Nitro Toluene | 263 kgs. |
| 19. | Meta Toluic Acid | 185 kgs. |
| 20. | Bromine | 336 kgs. |

Kindly contact the following address:

M/s. Associated Drug Co (P) Ltd.
35, Sampangi Tank Road, Bangalore 560 027.
**Phone: 224641**

**USL**

**STAINLESS STEEL TUBES & PIPES**



**AVAILABLE IN :**

- Welded, Cold drawn, Annealed & Pickled, Polished & in other Finishes.
- From 6 mm O.D. to 100 mm. O.D.
- Conforming to ASTM & ISO Standards.
- Available in different AISI Grades i.e. 304, 304L, 316, 316L, 321

**Central Agencies**

MANUFACTURERS ■ ENGINEERS ■ DISTRIBUTORS

4672/21, DARYA GANJ, NEAR FIRE STATION, DELHI 110 002. INDIA
OFF : 3273662 RES. : 3270422 FAX : 91-11-732793 TELEX 031-62460. 'GRAM 'RUBSUTEX'

Ready Available

IN TANKER LOAD & DRUM PACKING

**ETHYLENE DICHLORIDE**
**TRICHLOROETHYLENE**
**CARBON TETRACHLORIDE**

Also Available

Toluene, Benzene, o-Xylene, MEG, DEG, ACN, Solvent C-9

Please Contact Manufacturer

**AMI CHEM INDUSTRIES**

419-A, Paradise Complex, Sayajigunj, Baroda
**Tel.: Mr. J.N. SHAH O: 327360 R: 21986**

We regularly require 12-15 M.T. per month of food grade:

**ACID SODIUM PYROPHOSPHATE (ANHYDROU**
**ACID CALCIUM PHOSPHATE (ANHYDROUS**
**SODIUM ALUMINIUM SULPHATE (ANHYDROU**

Suppliers who can offer this material on a reliable and regular basis
may contact alongwith best quotations and samples:

**The Materials Manager**
**Weikfield Products Co. (I) Pvt. Ltd.**
Weikfield Estate, Nagar Road,
PUNE - 411 014.

**QUALITATIVELY & QUANTITATIVELY THE BEST**

☐ **GUM ACCACIA**
(Powder & Crystal)

☐ **GUAR GUM**
(Pharma & Other Grades)

☐ **GUM TRAGACANTH**
(Imported & Indian)

☐ **GUM ARABI**
(All Grades)

**We can supply as per New I.P. 1985 with Microbiological Test**

FOR YOUR REQUIREMENTS CONTACT:

**ASIAN ENTERPRISES**

New Bhagwan Bhuvan, Ground Floor. 196/198, Samuel Street, Bombay 400 009.
TEL. OFF.: 8720565
TELEX: 11-5781-VSON
RESI: MR. SHAH - 383365
RESI: MR. MODI - 4374289

We are keenly interested in taking up Agency for Pharmaceutical Raw Materials and Fine Chemical

# Industrial and export opportunities of other petrochemicals*

P.S. BALASUBRAMANIAN**

## REAMBLE

There is a boom in the market for various petrochemicals nd its end products in our country. These constitute polmers, co-polymers, synthetics in the field of engineering lastics, synthetic fibres, elastomers and other petrochemial intermediates. Recognising the need for scale of econoies, the Government of India has introduced Minimum conomic Size (MES) for various products. Prior to the introuction of this scheme, companies in the same industry were f different capacities resulting in an unfair competition in e market. Thanks to MES, now there is a common platorm (capacitywise). Government is also in a systematic anner trying to usher in fair prices for certain product roups. The 80's witnessed growing consciousness in comanies not only in the area of quality and energy savings, ut also in pollution/environmental controls and safety.

Covering the entire gamut of petrochemicals is a difficult sk due to the uniqueness of several products and complexies of the Indian/Export markets. It is indeed a very interting and absorbing topic. The details that have to be covered e multi faceted. Therefore, we will confine ourselves to ose products which normally do not fall under — plastics, nthetic fibres, etc. These could be considered as a family intermediates/monomers.

Survival of petrochemical industry in our country depend rgely on operating plants at maximum efficiency. Factors e energy savings, upgradation of technology will also play major part. From the Government side, it is essential that vestments are made on creating common infrastructural cilities which could be utilised by all the companies. They ould also play in eliminating unfair competition.

We have in this paper attempted to focus on the industry view of the selected products under the family "Other Petchemicals". An export review has also been dealt with. hile this paper covers only the above broad parameters, the dividual industries would be in a much better position to over the finer aspects so that effective measures could be ggested to the Government of India to increase our export rnings of these products.

## LINEAR ALKYL BENZENE (LAB)

**Introduction:** Linear Alkyl Benzene (LAB) is the all lation product of benzene and an olefin ($C_{10}$-$C_{14}$). LAB a product which is tailor made for its application as a surf tant raw material. It may be used singly or alongwith a other active matter for manufacture of synthetic detergen

Sodium Dodecyl Benzene Sulphonate (DDBS), deriv from propylene and benzene was the most widely used acti ingredient in synthetic detergents till 60's. However, as envronmental concern made its use less desirable, produce began looking for new biodegradable alternatives. For t past 15 years, Linear Alkyl Benzene has been the surfacta of choice because it is cost effective and biodegradabl Linear Alkyl Benzene Sulphonates (LABS) have replace the hard acid slurry, (DDBS) and have emerged as the secon generation detergent actives. The biodegradability of LAB has posed no great ecological problems and has been accepte in India. Although elsewhere in the world, several other detergent actives have made inroads, LABS will continue to b the workhorse of the detergent industry with regard to consumption, processability, universal applications and cost performance ratio.

The commodity used surfactants for household cleaning application fall into two broad categories — Anionic and Non-ionics.

**a) Anionics**

1. Linear Alkyl Benzene Sulphonates (LABS)
2. Alcohol Ether Sulphates (AES)
3. Alcohol Sulphates (AS)
4. Dodecyl Benzene Sulphonates (DDBS)
5. Secondary Alkane Sulphonates (SAS)
6. Alpha Olefin Sulphonates (AOS)

**b) Non-ionics:**

1. Alcohol Ethoxylates (AE)
2. Nonyl Phenol Ethoxylates (NPE)

DDBS is being phased out while nonyl phenol ethoxylates (NPE) are fairly limited to speciality and industrial surfactants. SAS is presently used only in Europe in light duty dishwashing liquids and AOS had some success in Japan. However, after fifteen years of development and commercialisation efforts, AOS has made only a limited impact in the US while in India, its superior characteristics are yet to

---

Paper circulated at the International Seminar on Chemicals & Pharmaceuticals held at Hyderabad from 19th to 21st July, 1990.

Managing Director, Tamil Nadu Petroproducts Ltd., Madras.

be proven and is in a nascent stage. Among the anionics, LAS, AS & AES are the most commonly used in United States but in India alcohol sulphates (AS) and alcohol ether sulphates (AES) are almost unknown. Although they have much superior properties, the main hurdle in the use of these products in India is the high cost of production — almost 2 times that of LAB.

**Present Capacity:** (Tonnes)

| | Installed | Licensed |
|---|---|---|
| IPCL | 43,000 | 43,000 |
| TPL | 50,000 | 60,000 |
| RIL | 50,000 | 60,000 |
| Total | 143,000 | 163,000 |

**Industry Review:** IPCL, till 1987 was the only manufacturer of LAB in India with a capacity of 30,000 TPA. At that stage the total consumption of LAB was approximately 80,000 tonnes with 50,000 tonnes being imported. By the fourth quarter of 1987 both TPL and RIL plants were commissioned and the IPCL capacity has recently been increased to 43,000 TPA taking the total licensed capacity to 163,000 TPA. The present production of LAB is approximately 130,000 TPA with the consumption at 110,000 TPA, leading to an excess in this industry. Both TPL and RIL have plans to expand their capacities, totalling 75,000 TPA which would take the licensed capacity to 218,000 tonnes. Further three more letter of intents have been issued out of which only Nirma and Hindustan Lever Limited are serious about implementation of the project. Nirma's project is likely to come through by early 1993 and that of HLL by 1995. Hence if new projects are implemented, by 1994-95 the total licensed capacity would be rising to 378,000 TPA while the demand during that period is expected to be only 185,000 TPA.

**Availability Scenario** (Tonnes)

| | 1987-88 | 1988-89 | 1989-90 |
|---|---|---|---|
| Production | 37,000 | 130,000 | 141,000 |
| Imports | 60,000 | -- | -- |
| Total availability | 97,000 | 130,000 | 141,000 |
| Apparent consumption | 90,000 | 110,000 | 125,000 |

**Forecast Demand:** It is expected that the demand for LAB is likely to grow at the rate of 10% until 1994-95 and by 8% until the turn of the century. The following is the expected demand for LAB:

| | |
|---|---|
| 1990-91 | 140,000 |
| 1991-92 | 154,000 |
| 1993-94 | 169,000 |
| 1994-95 | 185,000 |
| 1999-2000 | 295,000 |

As against this, the forecast demand as estimated by committee for Perspective Planning of Petrochemical In try is 287,000 tonnes by 1994-95 and 497,000 tonnes 1999-2000. This obviously seems to be too optimist growth rate which is not likely to happen. With the L demand likely to grow at not more than 10%, expansion existing capacities itself could very well meet the dem until 1999-2000.

**Forecast Capacity (TPA):**

| | |
|---|---|
| Existing | 143,00 |
| Expansion of existing facilities | 75,00 |
| Nirma | 80,00 |
| HLL | 80,00 |
| Total | 378,00 |

Hence it is very clear that if both Nirma and HLL go ahe with their project there is bound to be an excess capac created in the country by 1994-95. It is not only the new ur for LAB but also other competing surfactants like Alp Olefin Sulphonates (AOS), Secondary Alkane Sulphona (SAS) and Fatty/Detergent Alcohols which are likely to aff the growth of LAB. In fact, these products being used in sp ciality applications need to be encouraged as there is like to be greater conciousness towards environmental polluti and using quality personal care products.

**International Scenario:** The present worldwide to installed capacity would be approximately 1.6 million tonn of LAB. The growth of LAB is likely to be only 2-3% the future as other competing surfactants like detergent alc hols have captured more than 40% of the total surfacta market. However there is still good scope for export 15,000-20,000 TPA of LAB from India to countries li China, Iraq, Iran and other South East Asian countries. Ev Europe is likely to import some amount of LAB in the futu The only problem in export of LAB has been the high co of production compared to the low international prices. T present quotation for LAB in international market is appro imately US $ 620-640/MT whereas we would require a mi imum price of US $ 750/MT to cover atleast our variab cost. The present cash compensatory support (CCS) of 8 alongwith the duty drawback is found totally inadequate sustain any export commitments. A CCS of 20% could he in increasing the exports, thereby earning a higher forei exchange.

## ETHYLENE OXIDE/ETHYLENE GLYCOL

### a) Ethylene Oxide:

**Introduction:** Ethylene Oxide is a product of direct ox

0-85% is presently being used to produce Mono Ethylene ilycol (MEG), which is primarily used alongwith DMT/PTA or polymerisation. The rest 10-15% goes into the producion of surfactants, ethanolamines which is used in detergents nd soaps, and glycol ethers & polyethylene glycols which re used as solvents, plasticizers and lubricants. They also ind application in drug intermediates and in the manufacure of vinyl sulphones etc. which are used in dyes and dye ntermediates. The surfactant sector alone at present holds 0% of the market with amine derivatives holding 20% and rug and dye intermediates holding 10% each. In fact, there ; a shortage of EO towards use in dye intermediates with ne surge in export market for these products.

The demand for EO until a year back was almost fully met vith indigenous capacities. The product has been witnessing teady growth in the use of EO based condensates, thereby ecessitating import of certain EO based condensates. EO eing a highly hazardous chemical cannot be transported over irge distances and hence per se is not imported. There are lso certain newer promising markets for EO. Of late, a sigificant potential for special surfactants has been identified or use in oil exploration activities. With the new Governnents emphasis on an agricultural based economy, agrochemcal industry is poised for high rates of growth and this oupled with increasing awareness for health care and high erformance products is bound to lead to newer end use appliations boosting the demand of EO. EO based surfactants has ecognised application in oil exploration (as demulsifiers), grochemicals (pesticides), emulsifiers/demulsifiers in harmaceuticals, in automobiles (brake fluids), textile/leather uxiliaries, in industrial detergents and in personal care proucts. Spin finishes are yet another application where EO is vitnessing growth with the present boom in polyester fabric nanufacture.

**Manufacturing Process:** Manufacture of ethylene oxide ivolves direct oxidation of ethylene with either air or puried oxygen. Earlier processes involved oxidation with air, ut manufacturers have shifted from air to purified oxygen hich avoids introduction of large amounts of inert diluents hich must be purged from the system and making possible n efficient recycle system thereby utilising all the ethylene. eaction between ethylene and oxygen takes place in a tublar reactor filled with silver catalyst operating at 245-272°C nd 21 atm pressure. Rest of the process involves purificaon of the reactor products to obtain pure ethylene oxide.

**resent Licensed Capacity (TPA):**

| | | |
|---|---|---|
| NOCIL | : | 14,000 |
| IPCL | : | 10,000 |
| India Glycols | : | 2,000 |
| Total | : | 26,000 |

**Industry Review:** Even though the present licensed cap ity is 26,000 TPA of EO, production has been only appr imately 18,000 TPA. The present consumption of EC approximately 18,000 tonnes per annum just matching availability, but the non availability of more EO has b a major constraint in its growth. It is estimated that the pres demand would be of the order of 21,000 as there is good sc for export of EO based dye intermediates and is expec to grow more in the future.

**Forecast Demand:**

| | | |
|---|---|---|
| 1994-95 | : | 24,000 |
| 1999-2000 | : | 30,000 |

**Forecast Capacity (TPA):**

| | | |
|---|---|---|
| Existing | : | 26,000 |
| MGCC | : | 5,000 |
| Reliance | : | 5,000 |
| SM Dyechem | : | 10,000 |
| Total | : | 46,000 |

Other than these, Gandhar/Vizag petrochemical complex also envisages an unidentified capacity for EO, thus takir the total capacity in future to more than 50,000 tonnes, whic would be more than sufficient to cover the demand b 1999-2000.

**b). Mono Ethylene Glycol:**

**Introduction:** Mono Ethylene glycol is an hydration product of Ethylene Oxide and is primarily used (94%) in Indi for DMT/PTA polymerisation. It has small application in th explosive industry (4%) also. Antifreeze, the most importan use in the United States, is not likely to pick up in India. Th other miscellaneous uses include use in lacquers, ink etc.

**Manufacturing Process:** Ethylene Glycol is produced by the noncatalytic liquid phase hydration of ethylene oxide a 200°C and 14.6 ATM pressure. Approximately 88 wt% of the glycol fraction produced is mono ethylene glycol and the rest heavier glycol fractions. Further these are separated in multiple effect evaporators and in a series of vacuum distillation columns to produce pure mono ethylene glycol.

**Present Licensed Capacity (TPA):**

| | | |
|---|---|---|
| IPCL | : | 13,500 |
| NOCIL | : | 10,000 |
| India Glycols | : | 20,000 |
| JK Synthetics (Byproduct) | : | 750 |
| Total | : | 44,250 |

**Industry Review:** The present production of MEG is pproximately 36,000-37,000 TPA but the present consumpion is in the range of 93,000 MTA. Due to the restricted avaiability of MEG from domestic sources, the actual demand s being met through imports.

**vailability Scenario** (Tonnes)

| | 1986-87 | 1987-88 | 1988-89 |
|---|---|---|---|
| roduction | 20,760 | 17,965 | 18,200 |
| mports | 42,000 | 60,800 | 80,000 |
| pp. consumption | 62,760 | 78,756 | 98,200 |

**orecast Demand** (Tonnes)

| | 1994-95 | '99-2000 |
|---|---|---|
| *nd-uses* | | |
| olyester Fibre | 194,800 | 260,000 |
| xplosives | 5,000 | 8,000 |
| otal | 199,800 | 268,000 |

As indicated above there been a surge in the demand for MEG with a multifold increase in polyester production. With the expansion of the existing units and the establishment of new units, the production of polyester is expected to go up considerably consequently leading to an increased demand for MEG in the future. The above forecast demand is an estimation made by the Committee for Perspective Planning of Petrochemical Industry. The Committee's figure suggests that the demand for MEG will increase by 13% annually until 1994-95 followed by 10% annual increase till the end of the century.

**Forecast Capacity (TPA):**

| | |
|---|---|
| Existing | 44,250 |
| MGCC | 50,000 |
| Reliance | 60,000 |
| SM Dyechem | 50,000 |
| Total | 204,250 |

Other than these, the proposed Gandhar/Vizag Petrochemical Complexes also envisages 1,00,000 TPA each MEG plant but final approval for the these projects are yet to be given by the Government. If these projects are cleared, then the total capacities created would be more than enough to meet the demand until the turn of the century.

**International Scenario:** The worldwide capacity for EG has risen from the 1986 level of 6.98 million MTA to 7.30 million MTA by 1988. Another 2,20,000 MTA of capacity is expected to be added during the current year. Between now and 1995 nearly 2 million MTA of capacity will be add The total world demand for EG during 1988 was 5.6 milli MTA with 65% consumption in North America, West Euro and Japan. The 1995 demand is estimated at 7.2 million MT with the major consuming centres as indicated earlier co tributing 54%. Asian countries will be the major growth ar during the next 7 years. East Asia (23%), South Asia, Lat America and East Europe will constitute 46% of consum tion by 1995. Thus the potential for export does not see to exist.

## VINLY CHLORIDE MONOMER (VCM)/ETHYLEN DICHLORIDE (EDC)

**Introduction:** Both Vinyl Chloride Monomer (VCMO an Ethylene di Chloride (EDC) are primarily used as raw materials for polyvinyl chloride manufacture. EDC is cracked t get VCM. The HCl produced as byproduct of cracking i normally reacted with ethylene in the oxychlorination process to produce EDC for recycle. The versatility of the en product, polyvinyl chloride, has resulted in a highly competitive market for VCM and very efficient processes for it manufacture. PVC has been and continues to be the larges volume thermoplastic consumed in India. Demand for PV far outstrips the production and the gap is presently bein covered by either large scale import of PVC per se or VC which is one of the raw materials. Inspite of this, productio has not increased in the country since it is linked with th availability of ethylene, the source of which is usually a highl capital intensive cracker complex. It is in this context tha other viable process routes assume importance.

**Manufacturing Process:** Vinyl Chloride Monome (VCM), the intermediate for production of PVC can be produced either by chlorination of ethylene or hydrochlorination of acetalene. Ethylene is considered to be the mos economical and preferred feedstock for VCM production However, its availability gets linked with setting up of a larg cracker plant. Investments on a cracker plant alongwith sownstream units would cost anything between Rs. 2,500-3,50 crores. The planning and execution of such a complex take longer time period due to complexities involved in tying u feedstocks, financing arrangements, different technologies fo various downstream plants. On the other hand, a plant which produces a single downstream product such as PVC and which has a ready market could be produced using certai other process which calls for smaller investment and withi shorter time period.

In view of this, it may be of interest to discuss the 'Flame Cracking Technology' of Japan for VCM production directly from naphtha without linkage to a naphtha cracker. This particular technology was developed in early sixties based on which two plants were built in Japan. It was also license

Russia and India. The plant in India has been closed use of operational/economic problems, while the Rus- Plant built in 1972/73 is still operating. This particular nology has been further developed/improved jointly by apanese-US multinational and the experience gained has n gainfully utilised in bringing the technology upto the k following closely the conventional crackers.

hus to overcome the problem of shortage of PVC and imise imports to save on valuable foreign exchange, it ld be prudent to study the economic viability of the plant d on Flame Cracking Technology and compare it with peting routes of VCM manufacture from ethylene. PVC ts based on imported VCM also could be thought of as could save valuable foreign exchange through value addi-

**sent Capacity (VCM):**

| | | |
|---|---|---|
| CL | : | 55,275 TPA |
| OCIL | : | 20,600 TPA |
| | | 75,875 TPA |

**ndustry Review:** Both IPCL and NOCIL convert all M to PVC. The other manufacturers of PVC include Shri- and Calico Chemicals (both based on calcium carbide), V (imported VCM-25, 125 TPA) and CHEMPLAST ohol based). Thus the present indigenous capacity avail- for VCM is only 75,875 TPA whereas demand for VCM pproximately in the range of 1,60,000 TPA.

**ecast Demand:**

| 1994-95 | 1999-2000 |
|---|---|
| 3,20,000 | 5,50,000 |

his is as per the report made by the Committee for Per- tive Planning of Petrochemical Industry.

**ecast Capacity (TPA):**

| | |
|---|---|
| isting | 75,875 |
| eliance | 1,00,500 |
| nolex Pipes | 1,00,500 |
| | 2,76,875 |

esides the above capacities, the Auriya Gas Cracker, dhar Petrochemical Complex and Vizag Cracker all ide a 1,00,000 TPA PVC plant each for which 3,01,500 of VCM facilities would be created. But the final clear- of these projects by the Government is still pending. e, if all of the above project comes up, there is no further requirement of creating VCM capacity. But even if one o them doesn't come, to that extent extra capacity for VCM would have to be created.

## DETERGENT ALCOHOLS

**Introduction:** Detergent alcohols are higher aliphatic alcohols with carbon chain lengths ranging from twelve to eighteen and is little known to the Indian industry. However, detergent alcohols find extensive use in USA, Europe & Japan. The product derives its name from the fact that its major application lies in the detergent and surfactant industries. Those with a carbon chain length ranging from six to eleven are termed as plasticizer alcohols. The detergent alcohols could be derived either from natural sources (fats, oils, etc. — which is normally termed as fatty alcohols) or from synthetic sources (petrochemicals). Fatty alcohols (natural could be manufactured either by reduction of fatty acids/esters with sodium & a reducing alcohol or by hydrogenolysis of fatty acids/esters at high pressure and temperature. The important petroleum feedstocks used for synthetic detergent alcohol include ethylene, propylene and n-paraffins. The processes employed for their manufacture are the Ziegler chain growth process starting with ethylene as the feedstock, and the oxo process or hydroformylation where first, the olefin, hydrogen and carbon monoxide react to form an aldehyde which is then hydrogenated to alcohol. Both these processes attract quite a big investment of the order of Rs. 180-200 crores. The other major synthetic process is the direct oxidation of n-paraffin, which attracts relatively lesser investment to the tune of Rs. 150-160 crores.

Very little of the detergent alcohols produced the world over finds application as such. Almost all of the production is converted into sulphates, sulphonates, ethoxylates or other derivatives which find predominant use in surfactant industry, because of their surface active properties. With more and more concern about the ecological ramification of using phosphate builders in detergent formulations, focus is directed towards using non-phosphate builders like zeolites. Fatty/-detergent alcohol derivatives are highly compatible with zeolites & also could be used alongwith LABS in mixed active systems to enhance the properties of the final product. Detergent alcohol derivatives could be used for high/low foaming detergents and in particular is preferred for personal care products and liquid detergents. Other than these, detergent alcohols are also used in drugs, cosmetics and food industries. The various applications of detergent range alcohols have been given in Table 1. The cost/benefit ratio is quite attractive with detergent alcohols mixed active systems.

This is amply proven in Europe, US and Japan where together the detergent alcohols consumption is roughly 40% of the total anionic surfactant demand.

**Surfactants:** Surfactants derived from detergent range alcohols are widely used where emulsifying, dispersing, wetting or detergent properties are desired. These surfactants are readily biodegradable and are finding increased use in low phosphate and non-phosphate detergents. The alcohols provide the starting material for all of the surfactant types: nonionics, anionics, cationics and zeitterionics. The alkyl sulfates, such as sodium dodecyl sulfate, $C_{12}H_{25}OSO_3Na$ are known for their cleaning ability and voluminious, stable foam. Alkyl sulfates derived from $C_{12}$ through $C_{15}$ linear alcohols are widely used in consumer products, for instance in toothpastes, hair shampoos, carpet shampoos, and light-duty household cleaners, whereas those derived from $C_{16}$ and $C_{18}$ linear alcohols are used in heavy-duty household detergents. Detergents having good foam stability are claimed from mixtures of $C_{14}$, $C_{16}$ and $C_{18}$ linear alcohols. Minor amounts of unsulfated alcohols left in the alkyl sulfate detergents serve as foam stabilizers. The polyethoxylated alcohols, when sulfated and neutralized with a base such as sodium or ammonium hydroxide to give anionic surfactants, have wide application as light-duty dishwashing detergents and as part of the surfactant system of heavy duty household liquid and granular detergents. These and other more specialized surfactants have a wide variety of industrial and household applications.

The polyethoxylated alcohols in household use have an average ethylene oxide content from less than three to about fifteen moles per mole of alcohol. The reaction gives a broad range of ethoxylation; for example, in a material with an average of three ethylene oxide (EO) units, some of the molecules may have as many as twelve or fourteen EO units and others exist as the free alcohol. This gives the effect of a mixed surfactant system. The polyethoxylated alcohols are also used directly as nonionic surfactants. These surfactants have numerous industrial applications as wetting agents, dispersing agents and emulsifiers.

Cationic quaternary nitrogen surfactants of various types may be made by the condensation of tertiary amines with long chain alkyl halides, which are in turn obtained from the halogenation of a higher alcohol. Besides their use as surfactants, quaternary derivatives are widely used as disinfectants, bactericides, fungicides, antistatic agents and textile softeners. Speciality phosphate ester surfactants and emulsifying agents are made by the reaction of phosphorous pentoxide and a detergent range alcohol. Other surfactants derived from these alcohols are alkyl amine oxides and alkyl glyceryl sulfonates.

In another example of a surfactant application, dodecanol is used as a stabilizer for fire extinguishing foams. Hexadecanol and octadecanol are used in bar soaps and as antifoam agents in paper making and wastewater treatment and dodecanol or higher alcohols are used to limit foaming in
detergent compositions. The emulsion polymerisation o
ious monomers is practiced in the presence of an alky
fate surfactant, sometimes combined with free alcoho

**Cosmetics and Pharmaceuticals:** The major use of
adecanol is in cosmetics and pharmaceuticals, where i
octadecanol are used extensively as emollient addit
intermediates for perfume and flavour components, ar
bases for creams, ointments suppositories. The compat
ity of heavy cut alcohols with cosmetic materials or a
drug agents and their mildness, skin feel and low toxicity
made them preferred materials for these applications. Be
the linear alcohols, a branched chain hexadecyl alcoho
also been employed in this application. Higher alcohols
their derivatives are used in conditioning shampoos and
personal care products and in ingested materials such as
amins and sustained release tablets.

**Lubricants:** An important application of detergent r
alcohols is in production of polyalkyl methacrylates w
are used as fuel oil and lubricant additives. They fun
as viscosity index improvers, pour-point depressants, and
persants in motor oils, automatic transmission fluids
hydraulic fluids. The alcohols and their derivatives are
in greases in hot rolling of aluminium, in gear oils an
metal working fluids.

**Miscellaneous Applications:** The branched tridecyl
hol finds major application as its phthalate ester as a
ticizer for polyvinyl chloride resins. Higher alcohols
been found suitable as antistatic and lubricating agent
plastics and textiles and for the production of polyuret
foams. They are useful in the rubber and leather indus
and in the production of duplicating stencil sheets, l
graphic inks and decorative paper. A derusting paste con
ing mixed hexadecacol and octadecanol has been clai
Decorative candles can be made with formulations con
ing higher alcohols. Dodecanol is recommended for s
lizing rice, breads and noodles during warm weather an
an ingredient in a formulation for preventing fogging of
mobile windshields. Gallate esters of dodecanol are wi
used as preservatives and antioxidants in the food indu

**Indian Scenario:** Till the 1960's hard acid slurry (DD
was widely used in detergents. The biodegradeability p
lem was posing an ecological hazard. The visible proc
bio-accumulative property was the continous foam all thr
the water ways. Then came the linear alkyl benzene s
onate to the rescue of DDBS. The biodegradiability of L
has posed no great ecological problem, yet the aromatic
in the molecule is not easily biodegradable. This has
a second generation detergent active. Today a third gen
tion active has slowly found in roads, though to a very
ited extent, into the household and industrial deterg

## Table - 1
## USES OF DETERGENT RANGE ALCOHOLS

| lustry | Used as is | Use as derivative |
|---|---|---|
| tergent | Emollient, Foam Control | Surfactant, Softener |
| roleum and Lubricant | Drilling Mud | Emulsifier, Lubricant, Dispersant, Antirust Agent, Foamer, Viscosity Index Improver, Antioxidant, Oilfield Chemicals |
| riculture | Evaporation Suppressant | Pesticide, Emulsifier |
| emical Specialities | Chemical Intermediate | Emulsifier, Foam Control |
| stics | Mold-release Agent, Antifoam Polymerisation Agent, Antistatic Agent, Chemical Intermediate, Lubricant, Plastisol Stabilizer | Plasticizer, Emulsion Polymerisation, Surfactant, Lubricant, Dispersant, Antioxidant, Stabilizer |
| xtile | Lubricant, Foam Control, Antistatic Agent, Chemical Intermediate | Emulsifier, Finish, Softener |
| smetics and Pharma-ceuticals | Softener, Emollient, Chemical Intermediate | Emulsifier, Biocide |
| p and Paper | Plasticizer, Foam Control | |
| od | | Emulsifier, Flavour Component, Antioxidant |
| bber | Plasticizer, Dispersant | Plasticizer |
| nt and Coatings | Chemical Intermediate | Emulsifier |
| tal working | Lubricant | |
| neral Processing | Floatation Agent | Surfactant |

ducts. Most prominent among these are the alpha olefin phonates (AOS) and the fatty alcohol dervatives. Although cewise fatty alcohol derivatives are no competition for S, performancewise they are clearly ahead.

Vhile it is true that alcohol dervatives are effective for osphate free formulations and where biodegradability is issue, in India, as long as the Government has not woken to these issues, the detergent manufacturing companies under no obligation to taken cognisance of these envi- mental factors. This is especially true when even the reau of Indian Standards specifies minimum phosphate ntent as one of the detergent specification.

ndian detergent manufacturers are hardly exposed to the ge of detergent alcohols in their products and currently re is no manufacturer of synthetic detergent alcohol in our country. Only Aegis Chemicals manufacture fatty alcohols (licensed capacity 5,000 TPA), a major portion of which goes into personal care products. The face cream manufacturers use fatty alcohol derivatives directly as skin emollients. Bulk of the fatty alcohol after sulphation/ethoxylation goes in making of shampoos and toothpastes. About 20% of the fatty alcohol production goes into the textile auxiliaries and a further 10% goes into manufacture of leather chemicals. However, usage of fatty alcohol derivatives in detergents is yet untapped. The prime factor that is posing to be a stumbling block in this product being accepted among the detergent manufacturers has been the price of the product. It is priced more than double the cost of LAB. If it could be priced competetively to that of LAB then market could be easily developed considering the diverse applications it can be put to. It is expected that at a premium of 15-20% over LAB, detergent alcohols could find a market for approximately

20,000-30,000 TPA by 1994-95 and around 50,000 TPA by the turn of the century.

**International Scenario:** As had been indicated earlier, detergent alcohols account for approximately 40% of the total worldwide surfactant demand. As reported in the Second World Surfactant Congress, the surfactant consumption in western countries and in Japan in the year 1987 were as follows:

| | |
|---|---|
| Linear Alkyl Benzene Sulphonates | 984,000 MT |
| Alcohol Ether Sulphate | 350,000 MT |
| Alcohol Sulphate | 236,000 MT |
| Alcohol Ethoxylate | 467,000 MT |
| Alkyl Phenol Ethoxylates | 385,000 MT |

In the Western countries, these are expected to gr higher levels with increased Government restriction phosphate usage in detergent formulations and incr market for high concentrated liquid detergents. Presentl worldwide production capacity for detergent alcohols (i ing fatty alcohols) is 1.3 million tonnes per annum, 6 which is based on petrochemical sources.

However, the consumption is only 1.0 million tonnes ing to an excess capacity. Moreover, new capacities are planned based on natural materials in fatty oil rich cou such as Malaysia, Indonesia, Belgium and Brazil. Thus does not exist any scope for export from India.

**(To be contin**

Cyclohexanone Cyclohexane
Mix. of Cyclohexanol & Cyclohexanone
MANUFACTURED BY:
Gujarat State Fertilizers Co. Ltd.
BARODA
25 CRESCENT SILVER JUBILEE
Please Contact Authorised Distributors:
Crescent Chemicals

**Sales Office:**
56-B, Sanjay Bldg., No. 5, Mittal Estate
Andheri-Kurla Road, Bombay 400 059.
**Tel: 6329110/6322136/6300157/6343555**
**Telex: 011-72284 CRES-IN**
**Grams:CRESOLVE, Bombay - 400 009**

**Branch:**
5-E, Vasant Kutir,
R.C. Dutt Road.
Baroda - 390 005.
**Phones: 324313/322279/320128**
**Grams: CRESCHEM, Baroda 390 005**

LOOKING FOR MERCURY SALTS?
Contact us immediately for super quality, competitive price.
Manufacturers of:
MERCURIC CHLORIDE
MERCURIC ACETATE
MERCURIC IODIDE
MERCURIC NITRATE
MERCURIC SULPHATE
MERCURIC OXIDE
MERCURIC THIOCYANATE
OTHER METALLIC SALTS
M/s. L.S. CHEMICALS & PHARMACEUTICALS
10, Kotkar Industrial Estate, Off Aarey Road, Goregaon (East), Bombay 400 063.
Phone: Factory: 692391 Office: 696963 Resi.: 6285735.
EXPORT ENQUIRIES ARE WELCOMED

# Directions of Leather Research in Nineties: A Forecast*

T. RAMASAMI
Central Leather Research Institute, Adyar, Madras 600 020

## Leather Industry: At Crossroads

Leather making has now become an intricate technology. It is no longer an artistic method practised for generations by the dictates of traditions. The impact of frontier areas of science on leather industry has brought about significant changes. Many technological innovations have been made in the leather sector. There is frequent turnover of leather processing technologies in recent times.

An international survey has been made on the 21st century needs of the leather industry recently. The major findings of survey have been listed in **Table 1.** The need for improvements in the intrinsic properties of leather, cleaner processing methods and cost reduction in tanneries has been identified. The fundamental understanding of leather making processes has remained a formidable task.

The leather processing involves reactions of a multifunctional molecule such as collagen in the form of a matrix with a variety of chemical substances and intricate complex physico-chemical phenomena. Therefore, the precise understanding of leather making processes using simple physical principles has not been easy. The molecular level understanding of leather making has eluded many scientific schools. However, there have been many phenomenal developments in leather technology. Some of these developments have been made because of the necessity.

The demands on the qualities of the leather were less exacting in the past. The tanning activity had then remained, by and large, in the rural sector. Both chemical and mechanical inputs in leather processing were considerably smaller in the traditional methods employed in the leather sector in the past. There has now been a transition from a tawing to a tanning technology. This has made a variety of chemical and mechanical inputs necessary. Leather has become a valuable export commodity for many developing countries. There is now increased competition for the same raw material pool from increased number of tanners in the Indian scene. A stiff international competition has emerged among the developing countries to serve the user market in advanced countries.

The developments in leather substitutes in the advanced countries are rapid. If such a substitute were found, it might well amount to a competition among the developed countries on one hand and the leather producing nations on the oth The mass produced synthetics are increasingly resemblin leather in many functional properties, although there has n yet been a true synthetic leather which matches all the uniqu properties of the natural fabric. In spite of new synthetics en ering the market, the demand for leather has not decrease

It is true that the leather industryis developing at a greate pace in the developing nations. However, such countries hav to take cue from the leather sector in the advanced nation where the leather industry has declined. The leather secto carries "not so good." image in the context of pollution. Th waste streams in tanneries are believed to be potentially toxi to the micro-environment. Therefore, leather making activ ity has become economically unviable for many advance nations. The social costs for the treatment of effluent on one hand and the costs of labour on the other make the leathe industry in the west unviable. The researchers in the leather science and technology had, therefore, to take into account some stark realities during the last five years. Some of these realities have been reviewed in this work for the sake of completeness.

Whereas the raw material cost is escalating, the leather making methods do not ensure the reduction of material wastes. The pressures of environmental protection regulations threaten the industry of total extinction in many nations in spite of the leather emerging as an economically valuable commodity for some countries. The leather industry is now at cross roads.

The identification of the right path to the progress and development of the right counter-offensive to the threat facing the leather sector rest with the community of researchers devoted to the cause of leather.

## Leather Research: The Need of the Industry

The challenges faced by the leather industry in recent times are formidable. The competition from the synthetics is high. The supply demand position in the case of raw material supply is unfavourable to the tanners. The cost of production of finished leather is increasing. The demands on the quality of leather as well as the product consistency are exacting.

The problem of pollution in tanneries has received wide publicity and the pressures to establish expansive effluent treatment systems are high. Although the effluent treatment ethodologies are continuously evolving, the need for in-lant control measures is being increasingly felt. The vari-us technology priorities of the industry which have emerged uring the last five years include:

---

*Paper presented at T.G.T-CLRI 1990.

. Better management of raw material resource potential,
2. Upgradation of lower ends and split finishing,
3. Cleaner tanning techniques, reduction in material wastes,
4. Increased process automation and
5. Increased productivity.

Although some technological possibilities have emerged in these areas, the research in these directions seems still the need of the hour. The convincing solutions to some of the major problems is still forthcoming.

### Improvement of Intrinsic Properties of Leather: A current Research Need

The rapid advances in the field of synthetics have forced the leather to acquire new and improved intrinsic properties without losing its uniqueness and comfort to the wearers of leather products. The trends in leather-making over the last 10 years have revealed that leather of increasing softness and improved resistance to smog, fire, smoke as well as staining has become popular. Leather is rapidly becoming a product for the quality circle and therefore, consistency in product quality is essential. Since leather making has remained a batch process, the variations in the raw material quality are large. It is demanding for the leather technologists to produce a product with consistent quality. Leather research has to aim at the needs to obtain consistently uniform product from the non-uniform raw material, viz., hide and skin. Various measures to minimise the post-mortem damages in raw hides and skins need to be worked out.

### Upgradation of Lower Ends: An Economy Priority

The increasing competition with synthetics makes it also necessary for the leather sector to limit the cost of production on one hand and to increase the return from any batch of leather on the other. Since there is a wide variation in the pricing structure of the top and lower quality of any batch of leather, technological innovations to upgrade the lower ends through finishing technologies have gained importance.

### Cost and Waste Reduction in Leather Making: An R & D Goal

The efforts to limit the cost of production, call also for the minimisation of wastes. The different cost centres in the leather making activity in India are indicated in **Table 2**. The data given in **Table 2** are only indicative figures and yet they highlight the relative importance of different cost structures in leather making. The recourses to research and development on such area's which contribute most to the ultimate product value gain higher importance.

### In-plant Control of Pollution: Crying Need of Tanner

Pollution problems associated with leather making hav emerged as a threat to the very survival of the industry. Ther are now after-treatment methods which enable the compliance of the regulatory laws of different countries. Howeve the more realistic solution to the problem of tannery pollution is in the development of in-plant control measures. Ther is now a need to audit the various processes and chemical used in leather making with regard to their ecological impac There is now, for instance, an active search for alternative to chromium as a tanning salt.

### Some General Research Trends

The raw material scarcity has made it necessary for th centres specialising in leather research to seek methods whic enable increased footage of leather for unit raw materia resource pool. In other words, splitting of hides or even skin followed by the finishing on both grain and flesh splits ha become a technological success already. Finishing technologies have already improved significantly. It has become possible to mask minor grain defects and ensure higher return from leather. The upgradation of lower ends and split fin ishing are two major themes which have attained commercial significance during the last five years. The current trenc indicate that these themes would continue to enjoy impo tance during the next five years also. The demand on th leather are becoming increasingly more exacting. The tan ners have to necessarily take recourses to research in mee ing the needs of leather product manufacturers. One of th new developments in the leather sector is that there is a nee for the finished leather manufacturer to react more quick to the needs of the product sector.

Concepts such as Just in Time techniques are becomin increasingly important in the leather product sector in pa ticular. With escalating costs of the raw material, the inve tory problems have soared-up and the need to cut the proce time has become even more important. In a leather produ sector, the delivery schedules are so tight that innovative me sures in finishing of leather have become necessary. Th there are some general research trends in the leather sect and Central Leather Research Institute, Madras, for its pa has dovetailed the research programme in light of the p orities of the industry.

### Central Leather Research Institute: An Internation Name in Leather Research

Central Leather Research Institute, during the last fi years has identified some important areas of industrial priorities and sought a scientific solution to many problems. It seems meaningful to review here some of the new developments in the Institute.

### New Leather Processes

The major themes of research where significant results have been obtained in the institute are:

1. upgradation of lower ends,
2. increased returns from splits by novel methods,
3. upgradation of rural tanned leathers,
4. reduction of water in beam-house operations,
5. improved sole leather (smell free nd less water absorbent),
6. improved softness in buffalo and cow leathers,
7. improvement of strength in wool sheep leathers and
8. novel finishing methods of suedes.

### Improvements in Leather Process Control

The quality assurance in the global leather sector has attained a high importance and stringent process control measures in leather have become necessary. In this regard, the Institute has taken a number of steps which are as follows:

1. engineering back-up for the implementation of a project on the modernization of a tannery with process control devices and instrumentation,
2. designing of indigenous and cost effective microprocessor based process control devices for lower investments,
3. a counter current soaking method which enables reduction in water (>50%) and better controls.

### New Chemical and Bio-auxiliaries

Many sophisticated chemicals have been developed and a new enzyme for unhairing has been isolated and standardized.

The main pitch of the new developments is in the introduction of chemicals and auxiliaries for cleaner leather processing and improvement of intrinsic properties of leather. Some of the significant developments are:

1. successful isolation and pilot level standardization of a new enzyme preparation for unhairing,
2. successful commercialisation of a novel aluminium based tanning salt, Alutan,
3. commercial exploitation of acrylic binders,
4. new technologies for hydrophobic and substantive fatliquors,
5. commercial exploitation of a new aluminium chromium syntan, Alcrotan and
6. introduction of a number of chrome exhaust aids a chrome savers based on polyamide, polyhydroxy alum ium gels, protein hydrolysates, organic surface active c loids.

### Cleaner Tanning and Effluent Treatment Technique

Three waste streams in leather processing attracting t attention of CLRI in the past have been the soak, lime-sulfi and spent chrome liquors. In order to achieve better qual of the waste water from tanneries, both in-plant control a after treatment methods have been developed. The in-pla control measures attempted are:

1. less-salt curing methods,
2. enzyme unhairing technique and
3. less-chrome and chrome saving tanning methodoliges

Chrome recovery and reuse method have now become po sible and a demonstration plant is now working in a tanne in Kanpur. The Institute has taken a major role in the estal lishment of a number of common effluent treatment system in the country and has serviced as many as 180 tannerie during the last two years.

### Waste and By-product Utilisation

The Institute has identified some of the major waste pro ducts from both slaughter houses and tanneries. Appropriat technologies for the better utilisation of such products as wel as value added products from collagenous products have als been developed. Some of the highlights are:

1. collagen sheet for burn dressing and leprosy management
2. keratin filler for leather processing,
3. commercialistion of a textile sizing material from leather wastes,
4. new ensiling technology for ruminal contents,
5. shampoo and beer clarifier from collagenous wastes and
6. drug delivery systems from collagenous products.

It was brought out that as much as 6000 rupees worth of carcass products are not being recovered every year in India. The need for better meat handling system and improved slaughter house facilities were identified and presented in the form of recommendations to the professional bodies.

### Data-base Generation and Analysis

The Institute has taken the lead role in the generation of reliable data base for the planning and the promotion of the leather industry in India. Some of the major steps in this directions are:

1. completion of a nationwide survey on raw hides and skins resource potential

2. completion of a survey on the capacity utilisation in tanneries,
3. preparation of technical feasibility reports for leather complexes and
4. study on meat handling systems and women employment.

### Human Resource Development

Since one of the major and vital inputs in the leather sector in recent years is the trained manpower, the Institute has launched many initiatives in the area of human resource development. Some of the initiatives are:

1. launching a new master level course in footwear design and engineering,
2. conducting a number of courses on footwear design and fabrication,
3. training in byproduct utilisation,
4. training in leather goods manufacture and
5. refresher courses in leather manufacture.

### Some General Performance Indicators

The commitment of the Institute to develop and deliver technologies of interest to the immediate industry and service to the best of the ability is reflected by the external cash flow into the Institute in recent years. The years ahead are even more challenging not only to the Institute but to the entire leather sector. It is meaningful to assess the future directions of leather research in the international and national scene.

### Directions of Leather Research: A Scenario in the Developing Countries

Leather research in most developed countries is now shifting to the chemical and machinery supply houses. With the general decline in the leather making activity in such countries, a general emphasis is on the further processing of imported finished leathers from the developing countries. New innovations in adding value to such imported leathers would form the basis of research in the developed countries.

The technological developments in leather processing seems to need necessarily research inputs from large chemical supply houses with some notable exceptions. The Government supported research on leather is limited to only a few countries. In most institutes in developed countries, where the research is carried out on sponsored basis, short range programs with definite objective and short term targets are preferred.

The research on leather product design and fabrication for improved leather finishing techniques seem to be self-supporting in most industrial climates. Therefore, significa advances in the area of improved designs for leather pr ducts would be forthcoming both from the stand point of ae thetic and engineering aspects.

The concept of Just in Time technique has already gaine importance in leather product sector. The research on leath processing activity itself in the developed countries may we limit itself to:

1. the possible upgradation of imported leathers throug onovel finishing techniques and imparting new function properties with respect to both the surface appearance an feel,
2. developing functional substitute for leather,
3. develop cleaner tanning techniques to support the local tanning industry,
4. develop ecologically friendly systems for leather proce sing,
5. achieve higher process automation in both leather an leather product sector to minimise the labour costs,
6. develop new machinery and chemicals for catering to th global needs,
7. develop and design fail-safe after treatment systems,
8. develop alternative uses for collagenous products and sta dardize methods for gainful use of wastes from leather an leather product industry.

### Directions of Leather Research: A Scenario in the Developing World

The developing countries are now emerging as not onl the leather producers, but also as the leather product manufacturers. Some of the developing countries like India hav strength of the raw material supply, skill, abundant suppl of manpower and technical expertise; but the dominant mark and fashion decisions are in the developed world.

There are not many brand names in leather products fro the developing countries. There is now a need to re-examin the strengths and weaknesses of the leather sector in th developing countries and evolve R & D plan which woul determine the directions of leather research for the ninetie The most developing countries attach also a social theme t the development of the leather sector. The leather industr in the world has a low ratio of investment for unit emplo ment. In other words, the leather sector provides highe employment ratio for unit investment.

Traditionally the leather making activity had remained i the rural sector. With the predominant population of a cou try like India remaining in the villages, it becomes nece sary to develop suitable strategies for the development of th Nation. This includes also a plan for the rural leather secto

The leather research needs to necessarily take into account t the carcass is becoming available in the village and the entific management of the raw hide or skin is essential the success of the leather sector in India. A number of vances in the area of carcass management have already en made and this needs active extension work. However, cessary technology for the short term preservation of the v hide or skin without using sodium chloride needs to be veloped.

A technology for an alternative crust which can be pro- ssed using ecologically acceptable methods may well be answer. This might even involve the elimination of curing, ne-sulfide unhairing, pickling and chrome tanning opera- ns. The development of such a technology is not easy and extension of such new conceptual methods may well be re difficult. The alternatives to such methods are in the gradation of tanning capabilities in rural areas. This can achieved to some extent, but the need to preserve the ecol- y would demand caution. It seems more relevant to develop skill in the villages in fabriction of hand-made leather oducts, where the ecological considerations can be better plied. The promotion of leather making activity has also include the necessary effluent management strategy and required level of financial investment. The design and velopment of a well laid out and engineered rural leather mplex where the preservation method would be more eco- gically acceptable may well be a direction of future research developing countries like India. The product of such com- xes can then be further processed in organized tanneries d leather product centres so that the return from the leather lustry can be optimised.

Since the strength of the Indian leather sector is in its capac- to serve the international needs, it is also necessary to velop an R & D strategy which would serve both the tional and international needs. With the increasing per- pita consumption of footwear and leather products in India, future direction of research would have to aim at the propriate mixing of non-leather materials in the produc- n manufacture.

### w Material Resource Management: A Definite R & D rection

The major cost centre in the leather sector is the raw mater- .

o develop the animal wealth both in terms of quantity and quality, for instance by way of goat farming,
to reduce the waste of such a valuable input,
to enhance the returns from a given raw material stock by way of upgradation, splitting followed by finishing,
to evolve reuse strategies for the unavoidable wastes of raw material and leather and
5. to economically exploit the imported raw stock and leather.

Research may well form some important directions of leather research in India.

### Some New Directions in Leather Processing

The R & D priorities of leather processing sector in a developing country like India are expected to be:

1. cost reduction and technology upgradation,
2. clean technologies,
3. quality improvement and assurance,
4. new chemical product for quality improvement,
5. waste management,
6. surface science for leather upgradation,
7. process optimization,
8. surface imaging for objective grading and assessment,
9. non-destructive testing,
10. leather cosmetics and polyurethane supplements,
11. time and material saving technologies,
12. water reduction in leather processing and
13. enhancement in productivity.

The modernization of leather processing activity to achieve quality improvement and assurance is a distinct future R & D goal. This needs to be coupled also to well-evolved R & D plans to pollution abatement.

### Pollution Abatement and Waste Management in Leather Sectors

The future developments in leather processing activity will necessarily be linked to the measures for pollution abatement. This calls for closer process audit, introduction of newer chemicals, adoption of newer methods, strict process control, proper layout and engineering strategy for the plant, seggregation of different waste streams and possible recycle modalities and a comprehensive effluent tretment method.

The increasing presures arising from environmental regulatory laws would place saltless curing methods, enzyme unhairing techniques, zero lime and zero sulphide unhairing methods, pickleless tanning, less-chrome and chrome-less tanning methods, chrome recovery and reuse methodologies and water-borne post-tanning auxiliaries are important. Rapid strides in these areas are likely.

An economically viable method of chrome sludge management and control of dissolved solids in tannery waste waters will emerge as the top priority. To combat the problem of solid waste disposal, even the mechanical operations such as shaving and buffing may give way to better methods of rendering the leather substance uniform. The waste reduction from the leather product industry may well contribute to the emergence of a new composite technology.

## Material Science and Leather Product Technology

Footwear is now emerging as an engineering material in which leather forms an integral part. The interplay of leather and non-leather components has become necessary for the success of leather product sector. Therefore, R & D directions in leather product sector need to include also the strengthening of material science aspects including development of new non-leather materials.

It seems logical to expect that R & D directions in leather product sector in developing countries like India would be:

1. development of new indigenous designs for leather products,
2. improvement of fabrication methods for increased productivity,
3. quality improvement and assurance,
4. new chemical products for footwear and leathergoods,
5. design of comfort footwear,
6. cost reduction in footwear manufacture,
7. development of footwear components.
8. process automation,
9. material (leather) saving technologies,
10. time-saving methods for quick response to consumer needs,
11. design, standardization and fabrication of lasts,
12. unit soles for footwear and
13. market research to assess international trends in fashions.

Since market for leather products may expand both in the national and international sectors, it may become necessary for the R & D thrust to be placed on the development of footwear for low cost as well as quality circle market. The use of non-leather components would become unavoidable for at least Indian market.

The international competitiveness for Indian leather products would demand also the building up of capabilities in market research.

## Market Research

The aquisition of reliable data base is crucial to the organised development of the leather product sector in a country like India.

The information base needs to be obtained in a scientific manner and includes the areas like:

1. foot survey,
2. resource, financial as well as manpower needs,
3. industrial capacity evaluation,
4. operations and productivity research,
5. international image building,
6. consumer awareness and
7. international trading and marketing.

The development of a commodity-oriened sectc leather products needs also inputs from many frontier Leather being a product of biomaterial, the importance ( science is large.

These sciences can well bring about a revolutionary c in the structure of the industry and already biotechnolo started making an impact on leather sector.

## Developments in Frontier Areas and their Role in Le Sector

Many areas of science play significant roles in the l sector to various extents. Basic sciences are a fundan need for the organised and scientific development of a nology.

Leather technology calls for inputs from many ar science and it would be impossible to forecast the ext influence of basic sciences in the leather sector. Ther an attempt has not been made here to make such fore This is not to say that basic sciences are less importa it is just that imagination of the author fails him to p the future needs of information from basic sciences f leather sector.

Table 1
Priorities in research objectives

| Order priority | Objective | Target |
|---|---|---|
| 1 | Cost reduction | Production |
| 2 | Improved performance | Water-resistance |
| 3 | Clean technology | Less-chrome and chrome-less tannir |
| 4 | Quality consistency | Raw material qual |

Relative importance of factors influencing leather production during the next 15 years*

| Factors (1) | Overall r (2) |
|---|---|
| External constraints, e.g. environmental | 1 |

| (1) | (2) |
|---|---|
| elopments in process chemistry | 2 |
| nsumer demands | 3 |
| ovations in machinery | 4 |
| cess automation | 5 |
| rovement in work environment | 6 |
| lerstanding of collagen reactivity | 7 |
| ers | 8 |
| eat from synthetics | 9 |

ken from JILTA, April 1988

Table 2
Cost (recurring) centres in conventional leather production

| No. | Head | Total Value (estimated) (in crores) |
|---|---|---|
| | Raw Materials | 1900 |
| | Chemicals | 300 |
| | Manpower, utilities etc. | 220 |

## Concluding Remarks

The astrological predictions are generally based on the time-dependent inter-planetary positions. Whereas the exponents of astrology would aruge that what they practice is science, arguments to the contrary are always likely and advanced. What has been attempted here is again a forecast, a forecast based on the current trends and the past lessons. This forecast is prone to large margin of errors.

The erroneous part is a consequence of the limitations of human imaginations in general and that of the author in particular. The correct predictions, if any, reflect the strength of this institution and the colleagues with whom we have interacted over the years. This is by no means the opinion of the institution and it reflects largely our own personal views. This is an attempt to initiate healthy discussions on the R & D targets of the country.

The forecast may be shorsighted but the attempt is not. There can be no development without discussions and without discussions there can be no science. As long as the key to the progress is in science and technology, there may be contrasting views expressed before a national consensus evolved. We only hope that this personal view of ours initiates a dialogue and helps the cross-fertilization of ideas to emerge.

*Reliable Quality*
*Assured Supply*
**AMINO ETHYL PIPERAZINE (AEP)**
**APPLICATIONS :**
☐ Epoxy Curing Agents ☐ Emulsifiers
☐ Corrosion Inhibitors ☐ Pharmaceuticals
☐ Asphalt Additives ☐ Surfactants
From the only manufacturers in India
**DIAMINES AND CHEMICALS LIMITED**
International Quality with Indigenous Ingenuity.
**Ahmedabad (H.O) :**
1, National Chambers,
Ashram Road,
Ahmedabad 380 009
Phone : 409626, 405748
Gram : DIAMINES
**Baroda (Works) :**
Plot No. 13,
P.O. Petrofils 391 347
Dist. Baroda.
Phone : 73305/406
Gram : DIAMINES
Telex : 0175 352 DACL IN
**Bombay Office :**
85, 'C' Wing Mittal Towers,
8th Floor, Nariman Point,
Bombay - 400 021
Phone : 2029507
Gram : CELAGAR
Novnit/213/90

# NEW PRODUCTS

## AQUEOUS PU RESINS FOR BETTER ADHESION

Two new aqueous polyurethane resins, EX-5066 and EX-5234 have been introduced by Stahl with the aim of promoting improved adhesion. Both are methyl and ethyl glycol ether free and will replace RU-9611 and RU-3506 in finishing systems. Both will be widely used on sheepskins and for producing thin film, soft and aniline finishes and also in conjunction with other Stahl microfine resins.

EX-5066 is normally applied to 'problem' full grain leathers as a sealer coat prior to the application of a conventional base coat. When used on impregnated corrected grain, it acts as a double impregnation, helping to upgrade substantially low-grade smooth non-printed leathers where a good filled aniline look is required. Although EX-5066 is an aqueous product, it is also solvent miscible and can therefore be used in conjunction with Stahl's LD-5900 and LD-6300 liquid dye series to enhance colour development in stain coats. With aqueous pigments, EX-5066 assists with colour correction and levelling.

Where a particular leather or effect is required EX-5066 can be modified with other adhesion promoting resins. Like EX-5066, EX-5234 also produces a soft film when dry, but is specifically designed for finishing leather for use in clothing and gloves and for soft full grain side leather. In addition to excellent adhesion EX-5234 gives excellent flexibility and cold-crack properties.

## NEW FATLIQUOR FOR SOFT, WHITE LEATHERS

Atlas Refinery has introduced Atlasol 23-KPM, a general purpose fatliquor based on synthetic sperm oil and a highly sulphated neatsfoot oil to yield soft, full and white leather. It exhibits high heat and light stability and is used to obtain almost any desired characteristics in the final product.

## NEW TOP COATING EMULSION

Corial EM Finish White C from BASF is a new top coating emulsion for white leather finishes. It gives surfaces which are resistant to yellowing and which possess good fastness properties, a pure white shade and medium gloss. Bastamol F Liquid, a new product from BASF, is used for the fixation of anionic products, particularly of aniline dyes on leather.

## NEW CATIONIC PRODUCTS FROM PIELCOLOR

New cationic products to meet the demand for a totally natural look on garment nappa and full grain leathers have been introduced by Pielcolor S.A. They make it possible to use lower quality leather which were previously not suitable for the natural aniline look. RC2406 and UR1446 are acrylic resins and PC9800 is a pigment series. They provide excellent levelling and covering capacity using the thinnest possible films yet the finishes they produce are even, smooth and exhibit both a natural look and feel. RC2406 and UR1446 are claimed to solve the adhesion problems experienced with many types of leather, even waterproof ones.

## TOTALLY NEW TOGGLING CONCEPT

A computer controlled toggle drying machine developed by Circe does away with mechanical clip devices to hold the leather. The skins are slicked onto a permeable synthetic material surface and held there by suction. The sli
surface is presented to the opera
a convenient angle.

Low temperature air (28°C-3
utilising a heat pump system, circu
to maintain low moisture level and
vide, it is claimed, higher yields
mellower leather, possibly elimin
the need for subsequent staking.
slicking system reduces labour
pared to conventional toggling whil
machine's computer memorises size
shape of skins to produce a graphic
play showing the operator the
effective loading pattern of skin
printout of the work performed rec
among other things, a utilisation e
ency factor and hourly produ
achieved. The machine is produce
various capacities according to req
ments. Typically, it may contain 48
arate plates, each loaded with 16 s
skins.

## NEW THROUGH-FEED SAMM ING MACHINE

The new Poletto PA through-
sammying machine has been desig
as a sturdy and compact machine w
is very easy to operate and service,
is versatile and reliable in operat
Felts can be replaced in a couple
hours and sammying pressure can
adjusted independently on the first
second rollers to enable a wide rang
leathers of different thickness, struct
and water content to be processed. S
of the interesting features of the s
myer include automatic centring of
felts with a drying pressure of up to
tons on each of the two sammying
lers, a large diameter spreading
roller with stainless steel sleekers
a sensitive barrier safety arrangeme
The machine is available in work
width models of 1800, 2200, 2700, 3
and 3330 mm.

# LEATHER ABSTRACTS

Natural/open leather drying in contrast with controlled drying. D.S. Roosesvelt, R. Krishnamurthy, M.A. Parameswaran, K.V. Raghavan, K.S. Jayaraman, K. Parthasarathy and G. Balaraman. *J. Am. Leath. Chem. Assoc.*, **85**, 105, 1990.

Drying of leather is a complicated process. While open/natural drying is less productive, faster drying proceses including radiation and the like processes, could result in densening and damaging the leather surface. To avoid these, a relatively slower process of drying with convection and conduction was developed using an electrical drying chamber. This paper presents details of the chamber and the drying characteristics of leather dried in the open and also in the chamber under conditions of 40°C and 60% pH.

Uneven natural cross-linking in hide fibrils. P. Kronic and B. Maleeff. *J. Am. Leath. Chem. Assoc.*, **85**, 122, 1990.

The techniques of differential scanning calorimetry and electron micr scopy were combined to show how bic chemical treatments can alter th cross-sections of collagen fibrils in ca skin.

The denatured cores that were pre viously shown to develop in the fibril at 65°C could be removed by digestio with trypsin which left hollow fibrils a empty sheaths. This will permit manip ulation of fibril cross-sections to pre pare leather with radially novel textura properties.

# NEWS FROM ABROAD

## BLFC COLOURCARD ON SUBSCRIPTION

The twice-yearly fashion and colour forecast of the British Leather Fashion Council (BLFC) is available on subscription. For UK subscribers the cost is reduced to £50 and for members of the British Leather Confederation £30. The forecasts are made at the beginning of March and September, approximately a year in advance of the spring/summer and autumn/winter periods to which they offer. For further details contact: The Secretary, British Leather Fashion Council Leather Trade House, King's Park Road, Mooltan Park, Northampton NN3 1JD, England.

## XXI IULTCS CONFERENCE

To avoid overlapping with Semaine de Cuir, the IULTCS conference will now be held on 25 to 29 September 1991 at Barcelona. The deadline for receipt of abstracts of papers to be considered for presentation is 15 July 1991. Abstracts should be in English, French, German, Italian or Spanish.

## ELECTRONIC TAGGING DEVICE STUDY

An Australian robotics expert is developing an electronic device to monitor cattle hides from the birth of the animal through the processing at an abattoir to the hides' arrival at a tannery.

The scheme will be tested in a pilot scale study during the year which will form the basis of a nation-wide hide improvement programme and it could add value to Australian hides and finished leather worth millions of dollars a year.

## MAJOR PROJECT ON DISCOLOURATION

A major investigation into the fundamental factors affecting discolouration in footwear materials is underway at SATRA Footwear Technology Centre.

Many of the fundamental mechanisms causing colour changes are not known and the project aims to remedy this by studying the chemical processes involved. Three types of discolouration in particular will be investigated:

(1) yellowing of whites/pastel shades (2) inter-component dye transfer and (3) darkening and changes to gloss level.

# INDIAN LEATHER SCENE

## GOVERNOR CALLS FOR LEATHER PERSPECTIVE PLAN

The Governor, Mr. S.S. Barnala, has called for greater research and development and interaction between research institutions and industries for upgrading the quality of leather products. "We are fortunate in having the Central Leather Research Institute in Madras which could act as a nucleus for all leather research", he said. Recently, the CLRI had developed an enzymatic unhairing process for skins which could reduce the basic cost. He expressed the hope that the CLRI would continue to play a crucial role to enable the industry to compete with developed nations.

Speaking at the silver jubilee of **Voice,** a journal for the leather industry, the Governor called for a perspective plan for the orderly development of the Industry to cater to exports. There was a dearth of skilled manpower at technical, managerial, supervisory and even at operative levels. Hence technology institutions should be set up to train personnel.

Leather exports had crossed Rs. 2000 crores in 1989-90. In the Seventies, the share of value added products to the total of leather exports was a meagre nine per cent. This had steadily increased to 30 per cent in 1980-81 and touched 56 per cent in 1989-90. It was expected to cross 65 per cent during the current year.

**Pollution hazards:**

Referring to the pollution caused by effluents from tanneries in the State, the Governor said that it had been observed that the chromium-rich effluent discharged into the Palar river had polluted the basin and the sub-soil water around. It had been confirmed that the high percentage of premature abortions in the North Arcot belt was attributable to the polluted water used by pregnant women. Hence the treatment of the effluents was imperative. Mr. Barnala congratulated the tanners for having agreed to implement common effluent treatment projects.

Messrs M. Mohammed Hashim, Chairman of the Council for Leather Exports, C.K. Duraivelan, Vice President, International Tanners Council, and T. Abdul Waheed, industrialist, referred to the contribution made by the journal for the development of leather industry. Mr. R.B. Mitra, Director, CLRI, released the silver jubilee supplement of the journal and received a cheque for Rs. 10,001 for an endowment from Mr. S. Nagarajan, Editor of the journal.

## FORMAL TAKEOVER OF ARUNA LEATHERS BY MRF HELD UP

The rigid stand taken by sundry creditors in realising their dues from Aruna Leathers and Exports Ltd., is holding up the formal takeover of the sick unit by the tyre giant, MRF Ltd. The Board for Industrial and Financial Reconstruction (BIFR), cleared in principle, Indian Bank's proposal to bring the unit under the fold of MRF. MRF had also taken control of the unit and is operating it. It is hopeful of revamping its operations and achieving an export turnover of Rs. 10 to 15 crores, a year.

While asking Indian Bank to prepare a revival package, BIFR is said to have favoured settling the outstanding liabilities (Rs. three to 3.5 crores) on a pro-rata basis with each party getting a uniform share of 50 per cent of their dues. Indian Bank has taken a reasonable stand and offered to accept 50 per cent of its dues, although in the normal course, it can claim 75 per cent. However, the sundry creditors, numbering over 30 and who have supplied chemicals, raw skin and other materials to the unit, are insisting on a 100 per cent tlement of their principal amo besides interest. In the event of continuing with this tough posi Indian Bank will have no option bu refer the issue back to BIFR, whic turn will order the winding up of company. In that case, the sundry cr itors will have to forego all their as they are unsecured.

## FOOTWEAR EXPORTS: ILPA SEEKS MORE SOPS

The Indian Leather Products Asso tion (ILPA) has called for the exer tion of footwear from excise besi seeking an increase in CCS on leat footwear from the current 20% to 2 as a follow-up to recent steps for boo ing exports. According to the Assoc tion, there is a strong case for relief these counts as footwear (along w leather garments) constitute the bulk value added products that are expor from the country. Its export has sho a 32 per cent growth having risen fr Rs. 13 crores to Rs. 17 crores, for financial year just ended.

Addressing the second annual gene meeting of ILPA (Southern Regio recently Mr. G.K. Gulati, the Assoc tion vice-president, wanted the Go ernment to speed up the process finished leather exports. In his view should be effected at the rate of 20 cent, 15 per cent and 10 per cent resp tively for various categories of finish leather in direct proportion to th usage in value added products.

Earlier, Mr. Mohan Goenka, Cha man, ILPA (Southern Region), broug home the point by saying that the sho fall in finished leather at the end of Eighth Plan Period was estimated at 2 million square feet. Foreign exchan earned on export of finished leathe ort, to meet the product exporters irements, would mean an outflow foreign exchange) to the tune of 760 crores, he added.

n this context Mr. Goenka urged the ernment to extend the deemed ort benefit to finished leather export- so as to encourage a smooth and dy flow of raw material to the pro- manufacturers. Similarly, the ket Development Assistance, which present caters to the needs of the er export houses alone, should bring hin its fold the small exporters as l so that they too are in a position ndertake, promotional activities.

Emphasising the need to adhere to ct international quality norms, Mr. ati said that Indian leather export- have earned a short reprieve with the st German Government putting off December 1990, the ban on imports ch contain more than 5mg per kg of ta-chloro-phenol, a preservative. A nplete ban on the use of PCP in the ian tanning industry has been advo- ed by the Association keeping in nd the long term interest of the coun-

## NTHUR SHOES LOOKS FOR E-UP TO SELL IN US

Senthur Shoes Ltd., is negotiating h Armour Tan, a leading American porter of shoes, for selling its pro- ts in the United States. The company already tied up with a Malaysian n for distributing its wares in the Far st, and a marketing arrangement for rope is also being finalised.

This was revealed by Mr. L. Laksh- nan, managing director in Bombay ile launching the company's forth- ning public issue. He said Senthur ll be the first to export quality com- site footwear to the West and Far st. Traditionally, India has been an porter of shoe uppers only. Senthur ll break this trend with a range of ecutive, casual and industrial safety shoes for export.

Mr. Lakshmanan, a leather technologist, said the plant (which was already gone on stream) is ideally located in Pillayarkuppam, the heart of Tamil Nadu's leather industry belt. This had ensured access to skilled labour and quality raw material. Most of the machinery is imported from British United Shoe Machinery of UK and sewing machines from Plaff of West Germany.

The initial installed capacity was three lakh pairs per annum which is being doubled. The company has an obligation to export 75 per cent of its production but the government has allowed the company a two year grace period during which it can sell all its wares in the country. During the first year, the company proposes to export at least 50 per cent of its output, Mr. Lakshmanan said.

Senthur is entering the capital market with a public issue of Rs. 1.8 crores to part finance its Rs. 4.3 crores project. The issue opened on August 27.

## UPGRADING LEATHER TECH: PHDCCI MOOTS TIE-UP WITH EEC MEMBER

The exporters of leather and leather products to the European Economic Company (EEC) should make some permanent arrangements at least with one of the members of the EEC countries which could ensure a continuous flow of styles, designs, technological upgradations and a free access to the modern machines and accessories, otherwise the country would be pushed out from the EEC countries, said a study conducted by the PHD Chamber of Commerce and Industry (PHDCCI) on "India's exports to the EEC of leather and leather products".

The East European countries enjoy special benefits from the EEC countries and they are likely to pose a real threat for the Indian exporters in the EEC countries, in 1992, when it would behave like a single market, the Indian exporters could sustain their level in the EEC markets only through continuous product development, the study added.

India's export of leather and leather products stood at 285 million ECU in 1989 compared to 282 ECU million in the first six months of 1988.

Significantly, the exports to four EEC member countries namely Ireland, United Kingdom, Portugal and West Germany witnessed rise during this period but in the other eight countries the export declined. However, the composition of India's exports basket indicates clearly a shift towards increase in value-added finished products, the study added.

The study revealed that the exports of semi-finished hides and skins have been nearly halved compared to the corresponding period of the previous year. There has also been a marginal decrease in the exports of finished hides and skins, while in the case of value-added products almost all the sub-groups have registered excellent positive growth rate.

The study observed that the exports of belts and girdles witnessed the highest growth rate of nearly 45 per cent followed by the industrial and fancy gloves by 37 per cent. The leather garments recorded a rise of 36 per cent. However, footwear was the only exception where the exports growth rate came down by 18 per cent.

The study underlined the need for some sort of agreement with some of the companies of the Federal Republic of Germany since 35 per cent of our leather and leather-products were exported to that country alone.

## LEATHER INDUSTRY TOLD TO DEVELOP DESIGN SKILLS

The Union Industries Minister, Mr. Ajit Singh, has said that time has come

ONE SOURCE FOR EVERY HIGH QUALITY
ENZYME

★ ENZYMES ★
Amyloglucosidase
Bacterial protease
Chymotrypsin
Fungal Amylase
Fungal Diastase
Lactase ★ Lysozyme
Malt Diastase
Pancreatin ★ Papain
Pectinase ★ Pepsin
Trypsin Chymotrypsin
Mixtures
Serra Peptidase

★ BIOCHEMICALS ★
● Bovine Albumin ● Haemoglobin Powder ● Heparin Sodium ● Lactobacillus Acidophilus

★ SPECIAL ENZYME ★
BLENDS
● Animal and Poultry Feed ● Bakery Application ● Leather Bating ● Protein Hydrolysis ● Textile Processing

Rathi
PAPAINS PVT. LTD.

Admn. Office : 105/106, Dhanlaxmi Ind. Estate, Opp. Golden Dyes, Old Agra Road, Thane (W)-400 601. Cable : PAPAINS Phones : 504011, 503445, 594705. FAX : (022) 2872811
CITY LIASON : 75-76-A, Mittal Court, Nariman Point, Bombay-400 021. Phone : 244147, 244157, 2049014 Telex : 112844 Cable : Taskforce (Bombay)

WE ALSO STOCK REFERENCE STANDARDS FROM SIGMA & FIP COMMISSION

GRADATION

for India to think of creating a brand identity for itself with good quality design for leather products catering to the export markets.

Inaugurating the Indian Chamber of Leather Industry (ICOLI) recently, the Minister said that in spite of making great strides, the leather industry unfortunately is yet to develop design skills and is totally dependant on its foreign buyers for design and even embellishments and components, keeping India at the level of job work only.

"We have expanded production of leather products to the limits of raw materials available within the country and we are even importing raw materials. It is time now for us to add value to this production and to earn higher foreign exchange for the same products by building up an improved image with regard to quality and design," Mr. Singh said.

Speaking of the growth in the leather industry, the Minister said that the growth rate of 28% per annum recorded by the leather sector in the Seventh Plan largely contributed to the value of exports from a level of about Rs. 500 crores at the beginning of the plan to over Rs. 2,000 crores by 1988-89.

He said such a dynamic growth has been possible not only because of certain significant developments in the principal leather exporting countries leading to a decline, but also because of continuous liberalisation by the Union Government in the licensing and export policies, enabling entrepreneurs to take advantage of the situation.

He urged the small and medium entrepreneurs to take advantage of the rising costs in traditional leather goods exporting countries and earn foreign exchange as well as a reputation of quality and delivery for the country. The Minister said that the growth of the leather industry has important implications on the economy as a whole as it generates massive employment
in industrialised urban areas bu
rural areas.

Although the structure of
ment has been changing from ti
yard units to organised
employment, it still remains a
try essentially employing ordin
killed and semi-skilled labour,
abundantly available in the cou
said. India has to take advantag
vast livestock population provid
materials for this industry and a
technical and managerial powe
able in the country to surge ah
other competitors in this sect
Singh said.

He expressed concern over th
of training of manpower in this
which has proved to be a seriou
tleneck. He said the Industry M
is exploring possibilities of
international assistance for upg
the existing training facilities and
setting up of new training c
including centres for the improv
of design and quality.

Mr. Singh said that modernisat
the leather industry is an ab
requirement if India is to make
progress on then export front and
the international standards in qu

He said that a proposal for a mo
sation fund had been put up durin
8th Plan to cater to the financial re
ments of the small and medium u
the leather sector. He urged ICO
take initiative and follow up the p
sals and organise its membe
improve the lot of the leather ind

Speaking on the occasion, the
tive President of the ICOLI an
Managing Director of Mideast
Ltd., Mrs. Rita Singh, said that the
objective of the formation of ICO
to assist the industry in enha
leather exports by new and m
marketing methods and participati
fairs and exhibitions

# New Developments from Japan

## )NICA PRODUCES TONER IN S.

Konica Supplies Manufacturing S.A. Inc. recently began to produce er for plain-paper copiers using a v plant built in Elkton, Maryland, the ited States. The company is affiliated h Konica Corp., Japan's 2nd-largest ducer of photosensitive materials.

Roughly one-third of Konica's piers are marketed in the States, pier business calls for steady supply expendables including toner, devel- ers and photo sensitive material. The S. subsidiary is considering produc- such expendables as well. It is Kon- 's fourth overseas production base.

## 'D APPLIED TO PRODUCTION ' HIGH-PURITY AI NITRIDE

Denki Kagaku K.K. has succeeded in ducing pyrolytic aluminum nitride ALN) and pyrolytic silicon nitride SN) using a chemical-vapour- osition (CVD) method.

The company has begun sample iveries of formed products of P-ALN l P-SN by making use of a CVD nt for pyrolytic boron (P-BN) located its Omuta factory (Fukuoka Prefec- e). It has already pioneered pyroly- graphite as well as P-BN. mmercial production of P-ALN and SN will help extend the company's duct line of CVD ceramics.

When compared with a conventional -press method, the CVD process ures production of ultracompact med products and is capable of ucing impurities contained therein to level of a few PPM.

P-ALN and P-SN feature ultrahigh ity, corrosion/heat resistance and ctrical insulation. Their potential lications are parts for manufacturing ipment for semiconductors, high temperature-insulating components, target material for thin-film production and crucibles for melting and vacuum-evaporation uses.

The company regards CVD products as being indispensable to the manufacture of production equipment for high-density (4 megabits or more) semiconductors and compound semiconductors. It has test-manufactured 12 inch-diameter crucibles from P-ALN and P-SN.

The company has already commercialized C-BN-applied crucibles for pulling up compound semiconductors. They are, however, unsuitable for production of silicon semiconductors since boron is isolated therefrom, thereby reducing production efficiency for the targeted products.

## MULLITE WHISKER PRODUCED FROM COLLOIDAL MULLITE

Chichibu Cement Co. has succeeded in test-manufacturing mullite whiskers (diameter: 0.5-1 micron; length: 10-20 microns) by burning at 1,300-1,400°C sol containing colloidal mullite (size: 10 nm) and fluorine ions. The company claims that the products have the high-temperature, high-strength properties peculiar to mullite ceramics.

It envisages precisely examining their properties by applying them to the production of fiber-reinforced ceramics. Their potential application is reinforcement for metal and plastics. Various types of fiber used as reinforcement have already been put into practical use but mullite whiskers have been synthesized by the company for the first time in the world.

The company developed in 1987 technology for producing high-purity mullite particles (size: 0.2 micron) using a sol-gel process, thereby diversifying into fine-ceramics operations. They contain only small amounts of impurities and little glass phase and reach the theoretical maximum level of compactness after being baked for one to two hours.

A 5-t/m plant for mullite powder will be completed immediately and put into commercial operation at the company's Kumagaya factory.

## SOAP PRODUCERS TACKLING WASTE-PLASTIC PROBLEMS

Japan's Soap & Detergent Association will take a positive approach to waste-plastic disposal. As a first step, it will try to switch materials for toiletry containers to inflammable ones or make plastic containers thinner to reduce the energy consumption needed for incinerating them.

In an attempt to tackle waste-plastic problems in earnest, the association has formed an ad-hoc committee for plastic-container problems and plans to hold a lecture meeting in a team -up with Plastic Waste Management Institute. It envisages looking into the actual conditions abroad of switch-over of material for toiletry containers and legal regulations on them.

Waste plastics constitute serious social problems in the United States and Europe in particular. Central and local government have taken various countermeasures including classified collection of garbage, compulsory application of biodegradable/photodegradable plastics and taxation on nondegradable plastics.

In Japan about 70% of used plastics are disposed of through incineration, while in the States and Europe most of them are dumped. Incineration of plastic waste calls for large amounts of energy and it has recently become difficult in Japan to incinerate ordinary garbage.

Corn starch-applied biodegradable plastics are only broken down into small pieces or powder. Photodegradable plastics-based containers for detergent and shampoo may be broken down while being displayed at retail stores and kept at home.

The association believes that all these products will not be to bring about a complete solution to waste plastic problems.

Japan's toiletry industry has learned a lesson from disputes on phosphate-containing detergent and quickly employed countermeasures for CRC-applied aerosol products.

## 3,000°C-CLASS HIP EQUIPMENT DEVELOPED: KOBE STEEL

Kobe Steel, Ltd., has remodeled 2,000°C-class hot-isostatic-pressing (HIP) equipment into ultrahigh-temperature equipment, in which the temperature can be raised to 3,000°C. The new-type equipment will be applied to the treatment of structural-use ceramics and help pioneer exotic material.

The company has improved a radiation heat-insulating layer, a heater and an optical system for measuring temperatures within the equipment itself. The heater is produced from graphite and is capable of resisting ultrahigh temperatures. Argon and nitrogen are employed as atmospheric gases in the new equipment.

HIP equipment has been extensively used for pressuring/sintering target materials, removing faults therefrom and joining them through combined use of high levels of heat and pressure.

Studies have been made on how to raise the related applicable temperature so as to treat structural ceramics. The company previously developed 2,200°C-class HIP equipment incorporating a thermocouple designed to control temperatures and a 2,600°C-class one employing an optical temperature-measuring system.

## FRAGRANCE BUSINESS FINDS SCENT OF SUCCESS: 'BACKGROUND PERFUME' PROVIDED

The up and coming "fragrance business," a term applied to the commercialization of scents and aromas for a broad spectrum of application, is attracting attention from many sides. Notable is the growing boom in 'background perfume'' (BGP).

Dispersed in the air of offices, show rooms, hotel lobbies, and other areas where large numbers of people congregate, BGPs endeavors to create a pleasant atmosphere of relaxing, refreshing feelings.

Fragrances have often been considered a distant third to music and color on the list of amenities, a word that seems to be in vogue these days. But there is no question that fragances are now being cultivated into a theme of their own.

Makers of cosmetics and perfumes, for example, are teaming up with the construction industry and air conditioner manufacturers in an ambitious, cooperative approach toward fostering this promising field.

Research into the physiological and psychological effects of particular smells on human beings is making significant headway. Already, several aromas have been confirmed to stimulate the brain's alpha waves and display feelings of refreshment and tranquility.

Cosmetics giant Shiseido and other makers have put on the market both cosmetic and perfume products that make use of such aromatic effects.

Recent tests have involved spreading these fragrances throughout office buildings to create a more comfortable environment. Over the past 2-3 years, a number of enterprises from the cosmetic, fragrance, construction, offi
niture, and air conditioner secto
teamed up to raise developments
area to a feverish pitch.

Shimizu Corpn., a large genera
tractor, has come upon an inter
discovery with regard to the effe
fragrances in office environment
company found that dispersing a
trace of lemon scent into the air re
in computer keypunch operators m
50% fewer mistakes in their work.
stituting a lavender scent for l
reportedly reduced keyboard erro
20%, seemingly demonstrating th
ference in outcome according to in
ient mix. Meanwhile, Shiseido j
forces wtih Kajima Corp. to devel
automatic fragrance control device
two companies installed the devi
Kajima's "KI building", and
teamed up with office equipment
Uchida Yokjo Co. to continue te
aroma diffusions in office buildin

Another sizeable cosmetics manu
turer, Kanebo, Ltd., introduced a
house-developed variety of what it
"environmental fragrances" in the
bathing and meditation facilities
major resort hotel. The company is
actively involved in joint formulatio
BGPs with Taisei Corp. and Taker
Corporation.

Companies with primary earni
derived from fragrances, including T
asago International Corp. and S
Aromatic Co. have already achie
satisfactory results with pleasing sc
in offices and retail stores. Because
grances effects vary according to t
of smell and concentrations disper
the development of both scents
scent-controlling devices is extrem
delicate.

But with no shortage of new busin
opportunities presenting themselves
offices, hotels, conference rooms, sh
rooms the battle to formulate succe
ful "background perfumes" will p
bably be well worth the effort.

**For Your Requirement of**
**The Most Powerful Bleaching Agent:**

**SODIUM CHLORITE**

50%, 80% Flakes/ 23% Liquid
Used For Bleaching of:
Paper Pulp, Cellulose, Textiles, Synthetic Yarn,
Oils, Waxes, Guar Gum etc.
Manufactured by:

**Zed Chem Pvt. Ltd.**

**Office:**
Jaydip, 67 Chaitanyanagar,
Near Sardar Patel Stadium,
Ahmedabad 380 014.
**Tel.: 401423**

**Bombay Office:**
**Eastern Industries**
Kasturchand Mill Estate,
Dadar (West) Bombay 400 028.
**Tel.: 4221568/4304485**

**FOR ACTUAL USERS/EXPORTERS**

**PARA CHLORO META CRESOL**
**SACCHARIN SODIUM**
**PARA TOLUENE SULPHONAMIDE**
**PARA SULPHAMIDO BENZOIC ACID**
**PARA TOLUENE SULPHONYL UREA**
**2-NITRO BENZYL BROMIDE**
**N-BROMO SUCCINIMIDE**
**N-CHLORO SUCCINIMIDE**

Contact:

**M/s. UNITED CHEMICALS**

190/3B, Mangaldas Building,
Mangaldas Road,
Bombay 400 002.
**Tel.: 315368/294045/256433**
**Tlx.: 011-5235 UNIT IN**
**Cable: CHENUNI**

**AVAILABLE IN READY STOCK**

**K. ACID**
**M.U.A.**
**M.P.D.S.A.**
**GAMMA ACID**
**4 N.A.P.**
(Swastic Organics)
**VINYL SULPHONE**
(Govind Dyestuff Pvt. Ltd.)
**BETA NAPHTHOL**
(Multi Organics Pvt. Ltd.)
**BON ACID**
(Abhideep Chemicals Pvt. Ltd.)
**RESIST SALT**
(Sulpho Chem)
**B.D.H.**
**CHRYSOPHENINE**
**D.A.S.D.A.**
**SULPHANILIC ACID**

**Please Contact**

**EMCO CHEMICALS**

208, Garodia House,
100/104, Kazi Sayed Street,
Bombay 400 003.
**Tel.: Off.: 336868/345378**
**Resi.: 651504/6060413**

***Associates:***

**RUCHIR DYE CHEM**

FOR YOUR REGULAR REQUIREMENTS OF:

**MIXED XYLENE**
**(Ex - Kandla - Naked)**
**PHTHALIC ANHYDRIDE**
**DIACETONE**
**PHENOL**

**Note: Excise Gate Pass will be given for MODVAT Benefit**

Please Contact:

**BEEKAY ENTERPRISES**
503, Faiz-e-Qutbi, 375, Narsi Natha Street, Bombay 400 009.
**Phones: Office: 349080/345011/348475/322958; Resi: 5121572/5124452**
**Telex: 011-71707 BKE IN**

Attention

PHARMACEUTICAL MANUFACTURERS, DEALERS AND EXPORTERS

Now Readily Available

**ISONIAZID IP**

Please contact the manufacturers

**D.P. CHEM PVT. LTD.**

**Administrative Office**
329/2, Jhokan Bagh,
Jhansi (U.P.),
**Phone: 1126**

**Plant**
27, 28 Industrial Area,
Pratappura (Orchha),
Nirwari, Dist. Tikamgarg, (M.P.).

FOR YOUR REQUIREMENT OF

BUTYL/ETHYL ACETATE
TOLUENE/BENZENE/XYLENE
IPA/NBA/IBA
SOLVENT NAPHTHA LIGHT/HEAVY
C-IX
ISO PROPYL ALCOHOL
BENZYL ALCOHOL
METHYLENE CHLORIDE
TRICHLORO & PERCHLORO ETHYLENE
**CYCLOHEXANONE**

**LUBRICATING OILS**
HYDRAULIC, TRANSFORMER
COMPRESSOR, CUTTING, RUBBER
PROCESS & SILICON OILS
DDP/DBP
ACETONE/DIACETONE
M.I.B.K./M.E.K./M.E.G./D.E.G./P.E.G.
ETHERS 40-60°, 60-80°, 80-100°
**N-HEXANE & OTHER INDUSTRIAL SOLVENTS**
**N.C./STOVING & SYNTHETIC/THINNERS**
CHASIS, WHEEL BEARING, MULTIPURPOSE
& HIGH TEMPERATURE SILICON GREASES
& **RUST PREVENTIVES**
**SHELLAC & SEEDLAC (LAKHDAN)**

MARKETING AGENTS

**JATINDARA NATH & BROTHERS**
B-70/24 DSIDC Industrial Complex, Lawrence Road, Delhi 110 035.
Phones: 7113805 & 7112571

# MARKET INFORMATION

## Gulf Crisis Affects Prices

Vadgadi, Bombay's chemicals arket witnessed sharp increases in etroleum based chemicals owing to e Gulf conflict. Many small scale nits find themselves in tight spot. spite of bullish trend in the market, ublic sector units have maintained e prices of benzene, xylene etc. crylamide moved upto Rs. 82 folwed by GH-17 and PVA 173 due to shortage of ready goods. Xylene shot up to Rs. 22, toluene to Rs. 26 and IPA to Rs. 26. Phenol and hydrogen peroxide were quoted at higher levels at Rs. 26 and Rs. 39. Even phthalic anhhydride went upto Rs. 34 from Rs. 26. It is reported that manufacturers of caustic soda have formed cartel and jacked up the prices.

**We cannot guarantee the accuracy of the prices published in CHEMICAL WEEKLY as they are based only on the enquiries made by our correspondent -- and, as such they are not FIRM PRICES as between a buyer and seller. The prices are published only with a view to giving some ideas of the market conditions.**

**The prices are inclusive of Excise and Maharashtra Sales Tax.**

### (Prices as on August 20, 1990)

| DUSTRIAL CHEMICALS | Per Kg. |
|---|---|
| nmonium sulphate | 2.50 |
| nmonium phosphate (Mono) | 14.50 |
| nmonium phosphate (Di) | 14.50 |
| nmonium carbonate (Di) | 17.00 |
| nmonium bicarbonate | 6.00 |
| nmonium chloride | 3.25 |
| nmonium nitrate | 6.00 |
| senic white powder | 22+ST |
| rylamide (Resale) | 82.00 |
| rium carbonate | 20.00 |
| eaching powder (33% Cl) | 5.00 |
| Borax (Granular) | 16.00 |
| Borax (Powder) | 22.00 |
| Boric acid (Tech) | 32.00 |
| Bisphenol-A | 75.00 |
| Butyl carbitol | 106.00 |
| Caustic soda (Flakes) | 11.50 |
| Caustic soda (Solid) | 12.00 |
| Caustic soda (Lye) | 10.00 |
| Calcium chloride 70% (Solid) | 3.25 |
| Calcium chloride 75-80%(fused) | 3.50 |
| Calcium chloride 36% (Anhydrous) | 5.00 |
| Calcium carbonate (precipitated) | 6.00 |
| Calcium carbonate (Activated) | 5.75 |
| Cobalt oxide | 550.00 |
| Cresylic acid | 62.00 |
| Camphor (Indian) | 105.00 |
| Cream of Tartar (Tech.) China | 70.00 |
| Citric acid (Belgium) (Resale) | 47.00 |
| Citric acid (Indian) (Resale) | 41.00 |
| Copper sulphate | 24.00 |
| Chromic acid | 63.00 |
| Ethylene urea | 58.00 |
| Ferric chloride (Lumps) | 9.00 |
| Ferric chloride (Anhydrous) | 20.00 |
| Glue flakes | 15.00 |
| Glue sheets | 6.75 |
| Gohsenol GH-17 | 140.00 |
| Hydro | 39+ST |

FOR YOUR REQUIREMENT OF

**PARA CHLORO PHENOL**
**ORTHO CHLORO PHENOL**
**MONO CHLORO PHENOL**
**DICHLORO PHENE**
**SULFURYL CHLORIDE**
**E.D.T.A.**

**MONO CHLORO ACETIC ACID (MCA)**
**ISOPROPYL BROMIDE**
**CAUSTIC POTASH FLAKES**
**POTASSIUM CARBONATE**
**NORMAL BUTYL BROMIDE (NBBR)**

Authorised Dealer of

**M/s. Standard Alkali,**
**M/s. Anupam Rasayan,**
**M/s. Odex Chemicals Pvt. Ltd.,**
**M/s. P.K. Velu & Co. Pvt. Ltd.,**

Please Contact:

**Shree Amruta Organics Pvt. Ltd.**

813, Raheja Centre, 214, Nariman Point, Bombay 400 021.
**Phone: 240415, 243979, 2873680 Telex: 11 6053 SATC**
4A-B, Trade Centre, Near Stadium House,
Ahmedabad 380 014.
**Telephone: 462332**

| | |
|---|---|
| Hyflosupercell | 28.00 |
| Hexamine (Resale) | 36.00 |
| Industrial Wax | 25.00 |
| Litharge | 40.00 |
| Lead Acetate (Tech.) | 39.00 |
| Lithopone | 32.00 |
| Magnesium chloride (Crystal) | 2.00 |
| Menthol crystal (Flakes) | 355+Ex+ST |
| Menthol bold | 425+Ex+ST |
| Menthol crystal cold | 395+Ex+ST |
| Magnesium carbonate (Japan) | 30.00 |
| Magnesium carbonate (Indian) | 26.00 |
| Maleic Anhydride (Resale) | 39.00 |
| Mercury (34.5 Kgs) | 11,500.00 |
| Nickel chloride | 110.00 |
| Oxalic acid (Resale) | 15.00 |
| Peppermint oil (Rectified) | 188+Ex+ST |
| Potassium carbonate (Indian) | 28.00 |
| Potassium carbonate (Imported) | 32.00 |
| Potassium bichromate | 38.00 |
| Potassium phosphate (Mono) | 34.00 |
| Potassium phosphate (Di) | 25.00 |
| Polyvinyl alcohol (No. 117) | 93.00 |
| Polyvinyl alcohol (No. 173) | 140.00 |
| Polyvinyl alcohol (No. 208) | 170.00 |
| Paraformaldehyde (Resale) | 20.50 |
| Phthalic anhydride (Resale) | 34.00 |
| Pentaerythritol (Resale) | 49.00 |
| Paraffin wax | 22+ST |
| Rangolite (German) | 96+ST |
| Rangolite (Czech.) | 72.00 |
| Rangolite (China) | 53.00 |
| Sodium sulphate (Fine) | 3.75 |
| Sodium sulphate (Coarse) | 3.50 |
| Sodium sulphide 50-52% (Flakes) | 11.50+ST |
| Sodium sulphide 58-60% (Flakes) (TCL) | 25.00 |
| Sodium sulphide pure (Flakes) | 12.25 |
| Sodium nitrite (Resale) per 50 kg. | 1,300.00 |
| Sodium chlorite 80% (Spain) | 100+ST |
| Soda Ash (Tata) | 5.25 |
| Soda Ash (Birla) | 5.25 |
| Soda Ash (Imp.) | 5.00 |
| Sodium bicarbonate | 7.00 |
| Sodium bisulphite | 8.00 |
| Sodium silicate | 5.50 |
| Sodium acetate | 7.20 |
| Sodium alginate | 450.00 |
| Titanium Dioxide (Anatase) | 65.00 |
| Titanium Dioxide (Rutile – RCR$_2$) | 88+ST |
| Tartaric acid | 190.00 |
| Trisodium phosphate | 12.00 |
| Thiourea | 78.00 |
| Urea (Tech.) | 3.00 |
| Vacuum salt | 1.00 |
| Zinc Dust | 52.00 |
| Zinc Oxide | 54.00 |
| Zinc chloride powder (Tech.) | 20.50 |
| Zinc sulphate | 7.00 |

| SOLVENTS | Per Kg. |
|---|---|
| Acetic Acid Glacial (Resale) | 13.00 |
| Acetic Anhydride (Resale) | 33.50 |
| Acetone (Resale) | 19.00 |
| Adipic Acid | 90.00 |
| Aceto Acetanilide | 55.00 |
| Aniline Oil (HOC) | 46.00 |
| Benzoate Plasticiser | 62.00 |
| Butyl acrylate | 75.00 |
| Butyl stearate | 38.00 |
| Butanol | 32.00 |

Benzyl Alcohol
Benzyl Chloride
Benzo trichloride
Benzoyl chloride
Bromine Liquid
Chloroform
Carbon Tetrachloride
Cellosolve
Cyclohexanone
Cyclohexanol
Diacetone (Resale)
Diethyl Oxalate
Diethyl glycol (DEG)
Dioctyl Phthalate
Diallyl Phthalate
Dimethyl Phthalate
Dioctyl Adipate
Dibutyl Adipate
Dipentene
Dimethylamine 40%
Dimethylamine 50%
Ethyl Acetate
Ethyl Acrylate
Ethylene Dichloride
Ethylene Glycol
Formic Acid (Imp.)
Formaldehyde (Resale)
Glycerine (CP)
Glycerine (IW)
Hydrogen Peroxide 50% (Resale)
Isopropyl Alcohol
Isobutyl Alcohol (Resale)
Monoethanolamine (Resale)
Melamine
Methyl Ethyl Ketone
Methyl Isobutyl Ketone
Methyl Acrylate
Methylene Dichloride (Resale)

For Your Requirements Of:

Di Octyl Phthalate (D.O.P.)
Di Butyl Phthalate (D.B.P.)
Di Butyl Maleate (D.B.M.)
Di Octyl Maleate (D.O.M.)
Di Octyl Adipate (D.O.A.)
Butyl Stearate

Please Contact Manufacturers:

SAVITA ORGANIC CHEMICAL INDUSTRIE

1218, Dalamal Tower, Plot No. 211, Nariman Point, Bombay 400 021.
Phone: 230006, 231192, 233554, 233562

For Competitive Import of Pharmaceutical Substances, Chemicals &
Raw Materials and Particularly the following items:

ERGOT ALKALOIDS
SULPHONAMIDES
ANTIBIOTICS
AMINO ACIDS
INSECTICIDES
FUNGICIDES

HERBICIDES
RODENTICIDES
REPELLANTS
PHEROMONES
CARDIAC GLYCOSIDES
ANTI CANCER DRUGS

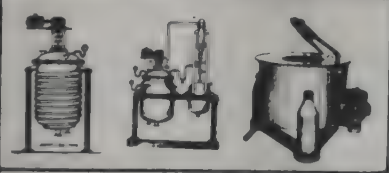
LITHOPONE, RANGOLITE
CAPROLACTAM
POTASSIUM & SODIUM HYDROXIDE
OXALIC ACID
ESSENTIALS OILS AND
AROMATIC PRODUCTS

RUBBER CHEMICALS, CONVEYOR BELTS, RUBBER PROCESSING AGENTS

Please Contact Exclusive Representatives Of:

M/s. CHEMAPOL, CZECHOSLOVAKIA
M/s. N. JIVANLAL & CO. PRIVATE LIMITED
Rawat Manzil, 2nd Floor, 50, Shamaldas Gandhi Marg, Bombay 400 002.
Tel.: 251685/252527/253193 Tlx.: 011-3865 Gram: NIRANJAN

BILLY-PEOPLE WHO KNOW WHAT CHEMICAL PLANT AND PROCESS INDUSTRY IS ALL ABOUT!



Our Manufacturing Range :
* CENTRIFUGES
* EVAPORATORS
* CRYSTALLISERS
* BALL MILLS
* MULTI MILLS * HEAT EXCHANGERS * TRAY DRYERS
* REACTION VESSELS * DRUM DRYERS
* FILTER PRESSES, ETC.

Available under IDBI Deferred Payment Scheme

Designers, Engineers & Manufacturers
BILLY ENGINEERING ENTERPRISES
761, Thiruvottiyur High Road Madras-600 081. Phone ; 554619

HOT NEWS FOR AEROSIL USERS

The much-awaited import-substitute for AEROSIL/FUMED SILICA
manufactured indigenously under German technical know-how

MICROSIL
COLLOIDAL SILICON DIOXIDE - NF)

FOR USE IN: PHARMACEUTICALS & COSMETICS,
PLASTIC REINFORCEMENT, PAINTS, ADHESIVES, RESINS ETC.

Contact Manufacturers:
LEUCHTSTOFFWERK (INDIA) PVT. LTD.
Phone: 224128 Post Box No. 2003 BOMBAY - 400 002. Gram: "GLOWORM"

| | |
|---|---|
| Meta Cresol | 45.00 |
| Nitrobenzene | 19.00 |
| Nitric Acid (Conc.) (RCF) | 2.50 |
| Ortho Cresol | 30+ST |
| Phenol (Resale) | 40 00 |
| Propylene Glycol | 52 00 |
| Polyethylene Glycol (No.200) | 50.00 |
| Polyethylene Glycol (No.400) | 68.00 |
| Polyethylene Glycol (No.500) | 52.00 |
| Polyethylene Glycol (No.1600) | 54.00 |
| Polyethylene Glycol (No.4000) | 80 00 |
| Polyethylene Glycol (No.6000) | 85 00 |
| Para Cresol | 120 00 |
| Styrene Monomer | 42.00 |
| Sorbitol | 14 00 |
| Sulphuric Acid | 2.80 |
| Trichloroethylene | 26 00 |
| Triethanolamine (Resale) | 85.00 |
| Turpentine Oil (Germany) | 8 00 |
| Turkey Red Oil (50%) | 20 00 |
| Vinyl Acetate Monomer | 52.00 |

| SOLVENTS | Per Litre |
|---|---|
| Benzene | 11.00 |
| N-Heptane | 10.50 |
| N-Hexane | 11.00 |
| Methanol | 8 50 |
| Solvent Naphtha Heavy | 10 50 |
| Solvent Naphtha Light | 8 50 |
| Toluene | 11 75 |
| Xylene | 22 00 |

### DYES INTERMEDIATES ( WITHOUT TAX AND EXCISE)

| | |
|---|---|
| Alphanaphthylamine | 65.00 |
| Alpha Naphthol (Imp.) | 155 00 |
| Aceto Acetic Ester (Methyl) | 65.00 |
| Ammonium Molybdate | 210.00 |
| Anthraquinone | 120.00 |
| Anthranilic Acid | 75 00 |
| 2-Amino 4-Nitrophenol | 140 00 |
| Blue B. Base (Local) | 305.00 |
| Beta Naphthol (Atul) | 71 00 |
| Benzidine Dihydrochloride (BDH) | 76 00 |
| Bromamine Acid | 449 00 |
| BON Acid (Incl. of excise) | 140 00 |
| Chicago Acid (Atul) | 350.00 |
| Coach Acid | 52 00 |
| C. Acid (Imp.) | 210 00 |
| Cyanuric Chloride | 156 00 |
| 2,4- DNCB | 27 00 |
| Dihydrothio PTOS (Imp.) | 1,500.00 |
| Dimethyl Aniline | 64 00 |
| Diethyl Aniline | 140 00 |
| Diamino stilbene disulphonic acid | 155 00 |
| 3,3-DCB (Imp.) | 200 00 |
| Gamma Acid (Atul) | 205 00 |
| H. Acid (Atul) | 95 00 |
| G Salt | 70 00 |
| Isophthalic Acid | 50 00 |
| J. Acid | 330 00 |
| J. Acid Urea | 450 00 |
| K Acid | 110 00 |
| MPDS (German) | 185 00 |
| MPD (Local) | |
| MPD (Japan) | 18 |
| Naphthenic Acid | 4 |
| N-Methyl J. Acid | 52 |
| N-Methyl Aniline | 12 |
| Naphthalene (Refined) | 2 |
| Ortho Anisidine (OA) (Imp.) | 11 |
| Ortho Dichloro Benzene (ODCB) | 1 |
| OT Base | 12 |
| Para Dichloro Benzene (PDCB) | 28 |
| Para Anisidine (PA local) | 128 |
| PNA | 88 |
| Para Cresidine (Imp.) | 380 |
| Para Amino Azo Benzene (India) | 135 |
| PNCB (HOC) | 54 |
| Para Amino Acetanilide | 200 |
| 1-Phenyl 3-Methyl 5-Pyrazolone | 135 |
| Phenyl J. Acid | 360 |
| Para Amino Benzoic Acid | 135 |
| PT Base | 135 |
| Rhoduline Acid | 520 |
| Resist Salt 80% | 28 |
| Resorcinol | 230 |
| Sodium Naphthionate | 65 |
| 5-Sulpho-Anthranilic Acid | 78 |
| Sulphanilic Acid | 30 |
| Sulpho Tobias Acid | 140 |
| Trichloro Benzene (TCB) | 22 |
| Tobias Acid (Imp.) | 132 |
| Metanilic Acid | 41 |
| MTD | 125 |

**We Manufacture Chemicals For Industrial Use**

- Acetic Acid
- Acetic Anhydride
- Acetaldehide
- Industrial Alcohol
- Monochloro Acetic Acid
- Ethyl Acetate
- Butyl Acetate
- E D T A
- N T A
- Carboxy Methyl Cellulose

**ASHOK ORGANIC INDUSTRIES LTD.**
406,Sharda Chambers, 33,Sir Vithaldas Thackersey Marg (New Marine Lines),Bombay-400 20
Phone : 252236 : 252256 : 317511 Gram : 'ASHOKBROS' Telex : 11-3853 AOIL IN

**Also Please Contact:**

**Baroda :** Phones : 324519-325769
Telex : 0175-597 AOIL IN
**Ahmedabad :** Phone : 78009
**Ankleshwar :** Phone : 2461-2462
Telex : 0189-238 AOIL IN

**New Delhi :** Phones : 5710733-5711057
**Calcutta :** Phones : 282474-282475
Telex : 021-7917 SBIL IN
**Madras :** Phone : 582046
Telex : 041-7527 SBIL IN

**Bangalore :** Phones: 570746-570760
Telex : 0845-8275 SBIL IN
**Hyderabad :** Phones : 73737-831049
**Poona :** Phone: 50797

**Plants at : Nandesari - Baroda; GIDC Ankleshwar; Boridra - Bharuch**

FOR YOUR REQUIREMENTS OF:

- * Sodium Sulphate Anhydrous
- * Caustic Soda Lye/Flakes
- * Sulphuric Acid
- * Oleum 20% - 23%
- * Carbon Tetra Chloride
- * Hydrochloric Acid
- * Spent Sulphuric Acid

Please Contact:

**INDIAN CHEMICALS**

Manufacturers Representatives

**Industrial Chemical & Acids**

432, Arun Chambers, Tardeo, Bombay 400 034.
Phones: 4938395/4949655/4949656 Cable: "VANIJYA", Bombay 400 018
Telex No.: 011-71682 CHEM IN Fax No.: 4937089

---

**A HOUSE FOR SOLVENTS & CHEMICALS**

- * ACETONE
- * S.B. TOLUENE
- * ETHYL ACETATE
- * N-HEXENE
- * ORTHOXYLENE
- * M.E.G.
- * M.E.K.
- * I.P.A.
- * DIACETONE
- * S.B. BENZENE
- * BUTYL ACETATE
- * N-BUTANOL
- * SOLVENT CIX
- * D.E.G.
- * M.I.B.K.
- * FORMALDEHYDE

CONTACT:

**GOODWILL RASAYAN**

296, Samuel Street, 4th Floor, R. No. 48
BOMBAY 400 003.
Tel: Off: 338410; Resi: 5130036

---

For Your Regular Requirements of:

Acetonitrile
Acetyl chloride
Acrylamide * Acrylonitrile
Allyl Alcohol
Alpha Picoline
Butyl Cellosolve * B.H.T.
Chloroform * Cyclohexane
Di Methyl Formamide
Di Methyl Sulphoxide
Epichloro Hydrine
Ethylene Dichloride
Formic Acid -- 99% & 85%
Hydroxylamine Hydrochloride
Hydroxylamine Sulphate
Iso Amyl Alcohol
Iso Butyl Alcohol
Iso Butyric Acid
Iso Propyl Alcohol
Lithium Hydroxide
Magnesium Oxide
Malonic Acid
Methyl Cellulose 4000
Methyl Cellosolve
Methyl Formate
Morpholine
Methyl Ethyl Ketone
N. Butyl Amine * N. Butyric Acid
N. Heptane * N. Propyl Amine
Quinoline * P.C.B.A.
Para formaldehyde 84-85%
Perchloro Ethylene
Petroleum Ether 40-60%, 60-80%, 60-95%
Secondary Butanol
Sodium Methoxide
Soya Lecithin Powder
Thiourea
Tri-Chloro Ethylene, T.E.G.
Tertiary Butyl Alcohol
Xanthone * Zinc dust

H.P.M.C. 5 CPS, 15CPS, 50CPS, 606 CPS

Please Contact: **Rajendra & Company**

Gopal House, 2nd Floor, 7/9, Kumbharwada Cross Lane, Veer Vithaldas Chandan Street, BOMBAY 400 003.
Phones: 321020/339968/344937 Residence: 6124644/6122149

# Bombay Dyes Market

(Prices as on August 20, 1990)

| ACID COLOURS | Per Kg. |
|---|---|
| Acid Violet 4BS | *190.00 |
| Acid Maroon V | 110.00 |
| Acid Orange II | 112.55 |
| Acid Orange IIY | 93.85 |
| Acid Red A | 137.00 |
| Acid Scarlet 3R | 128.35 |
| Acid Red 3BN | *195.00 |
| Acid Red R2R | 132.00 |
| Acid Red RS | 88 00 |
| Acid Patent Blue AS | *280 00 |
| Acid Green V | *375 00 |
| Acid Coomasi Blue | 200.00 |
| Acid Yellow 5GN | 65.00 |
| Acid Red PG | 85.00 |
| Acid Red GRS | 78 00 |
| Acid Black 10 BX | 157.15 |
| Acid Black BX | 126.95 |
| Acid Black Wax | 135.50 |
| Crosein Scarlet MOC | 200 30 |
| Procinil Yellow GS (ICI, UK) | 265.00 |
| Procinil Red GS (ICI, UK) | 530.00 |
| Procinil Blue RS (ICI, UK) | 315 00 |
| Procinil Scarlet G (ICI, UK) | 600.00 |
| Procinil Orange G (ICI, UK) | 250.00 |
| Procinil Rubine (ICI, UK) | 550.00 |

* To get resale price add 6% tax

| DIRECT COLOURS | Par Kg. |
|---|---|
| Yellow 3GX | 114.00 |
| Gun Yellow RCH | 175 85 |
| Fast Yellow GCH | 171.50 |
| Yellow CFG Hly. Conc. | 721.00 |
| Fast Yellow GS | 126 96 |
| Fast Yellow CHRS | 116.85 |
| Viscose Orange A | 210.35 |
| Fast Orange GR | 171.50 |
| Red | 122 65 |
| Dark Tan | 98.15 |
| Red IIR | 98.15 |
| Red 4B | 217.55 |
| Bordeaux BW | 170.10 |
| Fast Scarlet 4BS | 223.50 |
| Red 12B | 220.45 |
| Bordeaux Hly. Conc. | 249.20 |
| Cotton Red N | 117.05 |
| Brill. Fast Helio B | 362.85 |
| Brill. Fast Helio 2R | 385.85 |
| Brill. Fast Helio 2RS | 177.30 |
| Brill. Fast Helio BS | 116.10 |
| Brill. Violet Extra | 181.45 |
| Blue 2B | 102.50 |
| Blue G | 220.45 |
| Sky Blue FB | 242.00 |
| Copper Blue GR | 190.25 |
| Fast Greenish Blue GI | 114.60 |
| Developed Black BT | 149.95 |
| Blue NB-2B | 348.45 |
| Blue NB-2BG | 214.70 |
| Developed Black NB-GHB | 214.70 |
| Green B | 142.75 |
| Green NB-B | 218.90 |
| Green 2B-N | 218.90 |
| Brown MR | 197.40 |
| Brown CN | 137.00 |
| Golden Brown G | 175.85 |
| Catechin G | 155.70 |
| Omega Tan | 161.45 |
| Catechin GS | 102.80 |
| Black E Hly. Conc. | 180.15 |
| Black E Extra Hly. Conc. | 180.15 |
| Black NB-ER Hly. Conc. | 290.50 |
| Red 2B | 42 |
| Red FB | 42 |
| Red Violet FBL | 62 |
| Orange 3R | 25 |
| Violet 3R | 37 |
| Violet RL | 35 |
| Violet 6R | 63 |
| Scarlet RR | 28 |
| Rubine 3B | 28 |
| Rubine CB | 44 |
| Blue GL | 41 |
| Blue BGF | 80 |
| Navy Blue RE | 35 |
| Brown 3REL | 27 |
| Black GEL | 42 |
| Dark Brown 3B | 41 |

| DISPERSOL COLOURS | Per Kg. |
|---|---|
| Red B 3B Conc | 611.50 |
| Red B 2B Conc | 797.90 |
| Red CB Powder | 1048.25 |
| Red D2B Powder | 599.85 |
| Violet C 4R Conc. | 1202.70 |
| Blue BG Conc | 580 65 |
| Blue BN Powder | 128.20 |
| Blue D 2R Powder | 586.25 |
| Navy BT Conc | 531 95 |
| Blue B 2G Conc | 577.95 |
| Black BT Conc | 319.50 |
| Blue RR | 482.40 |
| Yellow 7GL | 813.20 |
| Yellow 5RX | 269.90 |
| Yellow 3G | 473.20 |
| Yellow | 140.00 |
| Yellow AL | 167.20 |
| Yellow Brown REL | 311.70 |
| Yellow FFL | 571.40 |
| Gold Yellow GG | 320.80 |
| Pink REL | 593.00 |
| Red BEL | 615 60 |

| BASE COLOURS | Per |
|---|---|
| Fast Yellow GC | 77 |
| Fast Orange GC | 12 |
| Fast Scarlet R | 19 |
| Fast Scarlet RC | 12 |
| Fast Scarlet RCR | 10 |
| Fast Scarlet G | 11 |
| Fast Scarlet GN | 9 |
| Fast Scarlet GG | 7 |
| Fast Scarlet GGS | 7 |
| Fast Red B | 23 |
| Fast Red RC | 11 |
| Fast Red R Flakes | 158 |
| Fast Red TR | 181 |
| Fast Red TR Oil | 223 |
| Fast Red RL | 251 |
| Fast Red KB Oil | 251 |
| Fast Bordeaux GP | 236 |
| Fast Garnet GBC | 103 |
| Fast Violet B | 548 |
| Fast Blue BB | 566 |

| NAPHTHOL COLOURS | Per |
|---|---|
| ASG | 301 |
| AS | 205. |
| ASSW | 379. |
| ASBS | 253. |
| ASBO | 266. |
| ASD | 209. |
| ASOL | 243. |

| | |
|---|---|
| TR | 369.00 |
| PH | 336.05 |
| E | 236 00 |
| EL | 249.95 |
| SLB | 2002.35 |
| SBT | 2459.45 |
| SWG | 143.00 |
| SSG | 538.65 |
| SSR | 652.60 |

| ROCION COLOURS | Per Kg. |
|---|---|
| olden Yellow HR | 207.95 |
| ill. Yellow H4G | 145.65 |
| pra Yellow H-8GP | 168.55 |
| ill. Yellow HE6G | 214.75 |
| ellow G-E4R | 276.05 |
| ill. Yellow H7G | 332.30 |
| ellow M4R | 275.45 |
| ellow MGR | 387.65 |
| ill. Yellow M4G | 201.15 |
| ill. Yellow M8G | 366.10 |
| ellow M3R | 244.70 |
| rill. Orange H2R | 303 80 |
| rill. Red H7B | 157 95 |
| rill. Orange M2R | 313.15 |
| rill Red H8B | 213 55 |
| rill. Scarlet H RN | 245.05 |
| upra Red H-3BP | 179.80 |
| rill. Red H-F3B | 243.45 |
| rill. Magenta HB | 182 00 |
| rill Red M 5B | 160 05 |
| rill Red M 8B | 218.35 |
| rill. Pink MB | 137 10 |
| rill. Magenta MB | 163.65 |
| rill. Purple H-3R | 219.55 |
| rill. Purple H-7R | 175.40 |
| avy Blue H 3R | 333.75 |
| rill Blue H-GR | 406.40 |
| rill. Blue H5G | 207 95 |
| lue H 5RX | 286.20 |
| rill. Blue H 7G | 213.95 |
| rill. Blue H 7RX | 358.15 |
| urquoise HA | 265.05 |
| upra Blue H-3RP | 595.30 |
| upra Turquoise H 2G P | 181.50 |
| Blue H-FRD | 305.80 |
| Navy Blue H3R | 333.75 |
| Blue H 5RX | 286.20 |
| Navy Blue M3R | 355.70 |
| Brill. Blue MR | 405.60 |
| Brill. Blue M RX | 214.20 |
| Brill. Blue M-G | 226.45 |
| Blue M 4GD | 369.40 |
| Navy Blue M RB | 341.85 |
| Turquoise M-G | 240.30 |
| Brill. Blue M GX | 516.25 |
| Blue 3R Acra Powder | 718.20 |
| Dark Brown H 6R | 248.45 |
| Cobalt Oxide | 285.00 |
| Green H4BD | 287.00 |
| Green H-E4BI | 169.80 |
| Red Brown H IF | 143.25 |
| Orange Brown H 28 | 209.05 |
| Brown M GRN | 188.80 |
| Black H-N | 314.20 |

| SULPHUR COLOURS | Per Kg. |
|---|---|
| Navy Blue | 210.35 |
| Green G | 194.55 |
| Black Grains Extra | 72.25 |
| Black Grains OG | 73.70 |
| Black GXE Conc. | 70 85 |
| Black GXE | 57 90 |
| Black GXR | 69.40 |
| Black Grains 800 | 62.80 |
| Black EXR Grains | 73.70 |
| Black EXR Grains 800 | 59.35 |

| VAT COLOURS (ICI) | Per Kg. |
|---|---|
| Yellow 5G Supra Disperse | 561.85 |
| Yellow 5G Acra Conc | 818 60 |
| Gold Orange 3G Pdr. Fine | 1158.45 |
| Brill. Orange 6R Pdr. Fine | 624.35 |
| Gold Orange 3G Supra Disp | 693 85 |
| Brill. Orange 6RX Powder | 394.30 |
| Brill. Red 3B Pdr Fine | 1214 15 |
| Brill. Red 3B Supra Disp | 867.45 |
| Brill. Purple 3R Acra Powder | 827 05 |
| Brill. Purple 2R Hly Conc. | 744.2 |
| Brill. Purple 4R Supra Disp. | 604.25 |
| Brill. Purple 2R Acra Conc. | 779.85 |
| Blue 2R Powder Fine | 675.3 |
| Blue BC Acra Con Pdr. Fine | 1013.15 |
| Blue BC Conc. Pdr. Fine | 713.65 |
| Blue R Conc. Pdr. Fine | 719.70 |
| Blue Conc. Powder | 645.80 |
| Brill. Blue 2R Hly. Conc. | 378.55 |
| Blue RR Supra Powder | 629.35 |
| Brill. Blue 2R Supra Disp. | 115.65 |
| Dark Blue 2R Powder Fine | 512.65 |
| Blue BC Supra Disp. | 419.65 |
| Jade Green XBN Powder Fine | 555.80 |
| Jade Green XBN Acra Conc. Pdr | 1026.05 |
| Jade Green 2G Pdr. Fine | 533.25 |
| Jade Green 2G Ptg. Paste | 125.40 |
| Jade Green XBN Ptg. Paste | 126.00 |
| Jade Green 2G Supra Disp. | 618.00 |
| Olive D Pdr. Fine | 563.90 |
| Olive Green B Supra Disp. | 421.70 |
| Jade Green XBN Supra Disp. (N) | 327.30 |
| Olive OMW Powder Fine | 698.55 |
| Olive OMW Supra Disp. | 538.05 |
| Olive D Supra Disp. | 361.70 |
| Olive R Supra Disp. | 470.25 |
| Olive D. Ptg. Paste | 193.00 |
| Olive Green B Ptg. Paste | 199.10 |
| Olive Green B Acra Conc. | 741 10 |
| Olive R Acra Conc.. | 779 85 |
| Brown R Pdr. Fine | 869.45 |
| Dark Brown 3R Fine | 826 25 |
| Brown G Supra Disp | 582 05 |
| Brown 2G Supra Disp. | 716 10 |
| Brown R Supra Disp. | 547.35 |
| Brown BR Powder | 867.75 |
| Dark Brown 3R Ptg Paste | 217 15 |
| Dark Brown 3R Supra Disp | 529 60 |
| Brown G Acra Conc. | 967.95 |
| Brown M. Powder Fine | 768.80 |
| Grey M. Supra Disp. | 585.45 |
| Blue BC Acra Conc. Pdr. Fine | 762.70 |
| Direct Black AC Supra Disp. | 415.75 |
| Direct Black AC Pdr. Fine | 574.70 |
| Direct Black CH Supra Disp | 190 45 |
| Direct ACD Ptg. Paste | 217 15 |

# Delhi Market

**DELHI: AUGUST 17 NNS** A mixed trend was witnessed in the Delhi chemicals market last week, says NNS. Business was poor due to closure of markets on the eve of Janmashtami and Independence Day.

Paraffin wax shot up by Rs. 75 at Rs. 1,075/50 kg in the absence of supplies from Assam Oil refineries. Slack and match waxes also spurted by Rs. 1,000/1,500 at Rs. 11,500 and Rs. 18,000 per tonne on tight supply position. Consumer demand was good. Wax will go up in future if supply position does not improve.

Residue wax, on the other hand, ruled easy at Rs. 3,800 per tonne, on dull demand from rubber shoe and chappal manufacturers. Rangolite Germany went up by Re. 1 at Rs. 85 per kg in the absence of fresh imports from Germany and coming seasonal demand from gur manufacturers. Menthol medium and flake gained Rs. 5/10 at Rs. 310 and Rs. 290 on poor arrivals from Uttar Pradesh, while menthol bold lost Rs. 5 at Rs. 335 in the absence of demand. Menthal oil went up from Rs. 198 to Rs. 200 but it came on its previous level. Sodium hydro sulphite Gulshan ruled steady at Rs. 38, Damosha at Rs. 39 and Kalali at Rs. 41 per kg on poor supply position.

Chatkolite eased by 50 paise at Rs. 55.50 per kg on poor offtake due to rainy season. Sufolite also lost 50 paise at Rs. 55.50. Ammonia bicarb moved down by Rs. 10 at Rs. 180 per 25 kg on poor demand from bakeries and sweet makers and good supply. Sodium nitrite lost Rs. 50 at Rs. 1,050/1,200 per 50 kg in the absence of demand. DMO ruled easy by Rs. 3 at Rs. 87 on poor offtake.

Dyes and colours section ruled easy at their previous level, on poor local and upcountry demand due to rainy season.

## (DELHI MARKET RATES AS ON AUGUST 17, 1990)

| | | | |
|---|---|---|---|
| Ammonia Bicarb (Per 25 Kg.) | 180.00 | Rangolite (Per Kg.) | 84.00 |
| Mercury (Per flask) | 11,100.00 | Tartaric acid France (Per Kg.) | 290.00 |
| Soda ash (Per bag) | 360/380.00 | Sufolite (Per Kg.) | 56.00 |
| Ammonium Chloride (50 Kg.) | 120/180.00 | Chatkolite (Per Kg.) | 54.50 |
| Caustic soda flakes (50 Kg.) | 520.00 | DMO (per Kg.) | 90.00 |
| Citric acid (Per 50 Kg.) | 1,900/2,350.00 | Boric acid Technical (Per 50 Kg.) | 1,525.00 |
| Stable Bleaching Powder Shriram (Per 25 Kg.) | 101.00 | Paraffin Wax (Per 50 Kg.) | 1,075.00 |
| Stable Bleaching Powder KCl (Per 25 Kg.) | 90.00 | Slack wax (Per metric tonne) | 11,500.00 |
| Stable Bleaching Powder Maruti (Per 25 Kg.) | 91.00 | Tartaric Acid (Swastik Per Kg.) | 225.00 |
| Stable Bleaching Powder Modi (Per 25 Kg.) | 92.00 | Borax Granular (Per 50 Kg.) | 800.00 |
| Sodium Bicarbonate (50 Kg.) | 315/325.00 | Borax Crystal (Per 50 Kg.) | 825.00 |
| Sodium Hydrosulphite (Per Kg.) | 38.00/41.00 | Sodium Nitrite (Per 50 Kg.) | 1,050/1,250.00 |
| | | Sodium Nitrate (Per 50 Kg.) | 500.00 |
| | | Camphor Thal (Per Kg.) | 110.00 |
| | | Camphor Powder (Per Kg.) | 96 00 |
| | | Menthol Bold (Per Kg.) | 335 00 |

| | |
|---|---|
| Menthol Medium (Per Kg.) | 3 |
| Menthol Flake (Per Kg.) | 29 |
| Mentha Oil (Per Kg.) | 19 |
| Glycerine (Per Kg.) | 55/5 |
| Sodium Silicate (Per quintal) | 300/40 |
| Hexamine (Per Kg.) | 3 |
| Acetic Acid Glacial (Per Kg.) | 1 |
| Copper Sulphate (Per quintal) | 2,300/2 |
| Formic Acid (Per Kg.) | 2 |
| Formaldehyde (Per Kg.) | |
| Hydrogen Peroxide (Per Kg.) | 3 |
| Calcium Carbonate (Per Tonne) | 2,800/5, |
| Acid Slurry Soft (Per Kg.) | 2 |
| Acid Slurry Hard (Per Kg.) | 3 |
| Phosphoric Acid (Per 50 Kg.) | 1,235 |
| Potassium Nitrate (Per quintal) | 1,000/1,250 |
| Potassium Permanganate (Per 50 Kg.) | 2,600/3,000 |
| Sodium Bichromate (Per 50 Kg.) | 1,575/1,600 |
| Trisodium Phosphate (50 Kg.) | 570 |
| Titanium Dioxide Anatase T.T.P. (Per Kg.) | 62 |
| Titanium Dioxide RC-822 (Per Kg.) | 84 |
| Titanium Dioxide Anatase K-Brand (Per Kg.) | 59 |
| Titanium Dioxide RCR-2 (Per Kg.) | N |
| Zinc Oxide (Per Kg.) | 46.00/50 |
| Phenol Carbolic Acid (Per Kg.) | 39 |
| Carbon Tetrachloride (Per Kg.) | 24 |
| Chloroform (Per Kg.) | 28 |
| Sodium Sulphate (Per metric tonne) | 3,600/3,900 |
| Naphthalene Balls (Per 50 Kg.) | 1,375 |

| DYES & COLOURS | (Per K |
|---|---|
| Naphthol AS | 175/211 |
| Naphthol ASG | 180/249 |
| Naphthol ASBS | 210/260 |
| Naphthol ASTR | 300/378 |
| Naphthol ASOL | 210/250 |
| Naphthol ASBO | 195/274 |

| DIRECT DYES | (Per K |
|---|---|
| Black E. Conc | 120/185 |
| Diazo Black B.T. | 105/154 |
| Green B | 90/147 |
| Blue 2-B | 60/107 |
| Blue 2-B 225% (JNR) | 125 |
| Sky Blue FB | 160/248 |
| Basic Auramine | 55/110 |
| Basic Rhodamine | 300/425 |
| Basic Methylene Blue | 100/180 |
| Basic Violet | 165/210 |
| Basic Malachite Green | 175 |
| Acid Orange | 75/111 |
| Congo Red H/C | 75/120 |

# Madras Market

Markets have started looking up n the commencement of festive ason. The tense situation prevail- in Gulf is being watched keenly any worsening of situation will ect the rates adversely. Mean- le, in the local market, soda ash es are moving down with the manufacturers offering special discounts for improving sales. Hydrogen peroxide prices have eased with the imported stocks coming to the market. Sodium nitrite prices have also come down on better availability. Caustic prices have remained unchanged.

## CALCUTTA MARKET
## (Prices as on August 19, 1990)

| | |
|---|---|
| Acetic acid (per 50 kg) | 750.00 |
| Basic chrome sulphate (per 50 kg) | 800.00 |
| Benzene (litre) | 11.50 |
| Bleaching powder (bag) | 235.00 |
| Borax granular (per 50 kg) | 800.00 |
| Boric acid (per 50 kg) | 1,625.00 |
| Camphor (per kg) | 102.00 |
| Caustic soda lye (per ton) | 10,020.00 |
| Caustic soda flakes (per 50 kg) | 560.00 |
| Glycerine (per kg) | 53.50 |
| Menthol bold (per kg) | 570.00 |
| Menthol medium (per kg) | 380.00 |
| Menthol small (per kg) | 300.00 |
| Phosphoric acid (per 50 kg) | 1,400.00 |
| Phenol (per kg) | 38.50 |
| Soda ash (75 kg) | 395.00 |
| Sodium bichromate (per 50 kg) | 1,500.00 |
| Sodium bicarbonate (per 50 kg) | 340.00 |
| Sodium nitrate (per 50 kg) | 450.00 |
| Sodium sulphate anhydrous (per 50 kg) | 320.00 |
| Sulphuric acid (per ton) | 2,200.00 |
| Trisodium phosphate (per 50 kg) | 610.00 |
| Toluene (litre) | 16.50 |

## (MADRAS MARKET RATES AS ON AUGUST 18, 1990)

| | |
|---|---|
| ic Acid Glacial (per kg) | 14.50 |
| inium Sulphate Iron free er MT) | 3,800.00 |
| nonium Bicarbonate er 25 kgs) | 150.00 |
| nonium Chloride (per MT) | 2,300.00 |
| Slurry (per kg) | 31.00 |
| um Carbonate (per kg) | 11.00 |
| um Chloride (per kg) | 10.00 |
| Acid Technical (per kg) | 26.00 |
| ching Powder (per 50 kgs) | 220.00 |
| x (per 50 kgs) | 785.00 |
| stic Soda Flakes -- Mettur emicals (per MT) | 11;500.00 |
| stic Soda Flakes -- Andhra gars (per MT) | 11,500.00 |
| um Chloride 70% Solid er MT) | 3,500.00 |
| um Chloride Anhydrous r MT) | 6,500.00 |
| um Carbonate (Activated) r MT) | 6,500.00 |
| um Carbonate (Precipitated) r MT) | 5,500.00 |
| Acid (per kg) | 48.50 |
| er Sulphate (per kg) | 22.00 |
| ylic Acid 98-99% (per kg) | 135.00 |
| Para Cresol 96% (per kg) | 85.00 |
| Para Cresol 42% (per kg) | 52.00 |
| ic Acid (per kg) | 26.00 |
| aldehyde (per kg) | 8.00 |
| Flakes (per kg) | 15.00 |
| rine I.W. (per kg) | 49.00 |
| sulphite o PL) (p | 38.00 |
| sulphite of Soda (IDI) (per kg) | 42.00 |
| Hydrosulphite of Soda (BASF) (per kg) | 48.00 |
| Hexamine (per kg) | 31.00 |
| Hyflosupercell (per kg) | 22.00 |
| Hydrogen Peroxide (per kg) | 38.00 |
| Litharge (per kg) | 38.00 |
| Lead Acetate (per kg) | 40.00 |
| Magnesium Carbonate (per kg) | 16.00 |
| Magnesium Chloride (per kg) | 4.00 |
| Maleic Anhydride (per kg) | 40.00 |
| Menthol Crystals (per kg) | 375.00 |
| Oxalic Acid (per kg) | 18.00 |
| Paraffin Wax (per kg) | 19.00 |
| Potassium Bichromate (per kg) | 36.00 |
| Phosphoric Acid (per kg) | 28.00 |
| Polyvinyl Alcohol Powder (per kg) | 150.00 |
| Pentaerythritol (per kg) | 51.00 |
| Phthalic Anhydride (per kg) | 30.00 |
| Soda Ash (TAC) (per 75 kgs) | 410.00 |
| Soda Ash (TATA) (per 75 kgs) | 385.00 |
| Sodium Bicarbonate (TATA) (per 50 kgs) | 385.00 |
| Sodium Silicate (per MT) | 3,900.00 |
| Sodium Bichromate (per kg) | 28.00 |
| Sodium Nitrate (per kg) | 8.00 |
| Sodium Nitrite (per kg) | 28.00 |
| Sodium Sulphide Flakes (per kg) | 20.00 |
| Sodium Bisulphite (per kg) | 8.00 |
| Sodium Alginate (per kg) | 295.00 |
| Sodium Acetate (per kg) | 7.50 |
| Sodium Sulphate (Anhydrous) (per kg) | 4.00 |
| Titanium Dioxide (Anatase) (per kg) | 62.00 |
| Titanium Dioxide (Rutile) (per kg) | 80.00 |
| Trisodium Phosphate (per kg) | 10.00 |
| Urea (Technical) (per kg) | 3.00 |
| Zinc Oxide (per kg) | 54.00 |
| Zinc Chloride Powder (per kg) | 14.00 |
| Zinc Sulphate (per kg) | 8.00 |

### SOLVENTS

| | |
|---|---|
| Acetone -- HOCL (per kg) | 18.50 |
| Butanol (per kg) | 35.00 |
| Butyl Acetate (per kg) | 42.00 |
| Benzene (per lit) | 14.00 |
| Cellosolve (per kg) | 65.00 |
| Carbon Tetra Chloride (per kg) | 23.00 |
| Chloroform (per kg) | 29.00 |
| Diacetone Alcohol (per kg) | 30.00 |
| Diethylene Glycol (per kg) | 30.00 |
| Dichloroethane (per kg) | 18.00 |
| Di-octyl Phthalate (per kg) | 46.00 |
| Di-N-butyl Phthalate (per kg) | 46.00 |
| Ethyl Acetate (per kg) | 18.00 |
| Isopropyl Alcohol (per kg) | 28.50 |
| Methanol (per kg) | 10.00 |
| Methylene Chloride (per kg) | 23.00 |
| Methyl Ethyl Ketone (per kg) | 33.00 |
| Methyl Isobutyl Ketone (per kg) | 41.50 |
| Phenol (per kg) | 38.00 |
| Sorbitol (per kg) | 15.00 |
| Triethanolamine (per kg) | 90.00 |
| Trichloroethylene (per kg) | 26.00 |
| 1-1-1 Trichloroethane (per kg) | 29.00 |
| Turpentine (per lit) | 16.00 |
| Toluene (per lit) | 14.00 |
| Xylene (per lit) | 20.00 |

# Shipping News

## VESSELS DUE IN BOMBAY FOR EXPORT LOADING

| Due Date (1) | Steamer's Name & Flag (2) | Agents (3) | Will load for (4) | Appr sailing (5) |
|---|---|---|---|---|
| 30/8 | Robert E Lee (Ame) | M.S.P.L. | Philadelphia; Baltimore; Norfolk; New Orleans; Houston; Savannah; New York. (Carting at P/Q-PD). | 30/ |
| 31/8 | Vishva Parimal (Ind) | S.C.I. | New York; Baltimore; Savannah; Norfolk; Charleston; Houston; Jacksonville; New Orleans; Boston; P Everglades. (Carting at T.P. No. 1). | 4/9 |
| 26/8 | Maersk Clementine (Sing) (V-9017) | Maersk Agency | New York; Philadelphia; Baltimore; Norfolk; Charleston; Savannah; Jacksonville; Miami; New Orleans; Houston; Toronto; Montreal; Chicago; Atlanta; Denver; Dallas; Wilmington; Milwaukee; Detroit; Minneapolis; Memphis; Nashville; Cleveland; Phoenix; Boston; Los Angeles; Vancouver; Seattle; San Francisco; Portland; Longbeach; Mexican and S. American Ports. (Carting at M.O.D. No. 2). | 30/ |
| 25/8 | Eagle Nova (Voy-019) | F.F.C. Co. | Los Angeles (Harbour); Longbeach; San Francisco; Oakland; Seattle; Vancouver (B.C.); Portland; New York; Boston; Norfolk; Baltimore; Charleston; Savannah; Miami; New Orleans; Houston; Montreal; Toronto; Fortworth; Chicago; Nashville; Atlanta; Philadelphia; Milwaukee; Kansas City; Phoenix; Guam; Dallas; Cleveland; St. Louis; Cincinnati; Denver; Louisville; Memphis; Wilmington (B.C.) San Diego; Minneapolis; Indianapolis; and Central American Ports; Honolulu. (Carting at Timber Pond No. 1). | 31/ |
| 24/8 | Hoegh Drake | Patvolk | Montreal; & Toronto via Halifax; New York; Boston; Norfolk; Charleston; Houston; Savannah; Wilmington; Philadelphia; Baltimore; New Orleans; & FCL Chicago; Milwaukee; Atlanta; Dallas. (Carting at H.B. No. 5). | 31/8 |
| 26/8 | Maersk Clementine | Maersk Agency | Lagos/Apapa; Dakar; Freetown; Monrovia; Lome, Cotonou; Doula; Tema. (Carting at M.O.D. No. 2). | 30/8 |
| 26/8 | Maersk Clementine | Maersk Agency | Leghorn; Marseilles; Naples; Barcelona; Bilbao; Bordeaux; Alicante; Genoa; Valencia; Bremen; Jeddah; Antwerp; Rotterdam; Bremerhaven; Hamburg; U.K. & Scandinavian Ports. (Carting at M.O.D. No. 2). | 30/8 |
| 31/8 | Vishva Parimal (Ind) | S.C.I. | P. Said; Felixstowe; Hamburg; Rotterdam; Antwerp; Bremen; Liverpool; Manchester; Avonmouth; London; Belfast; Aarhus; Oslo; Helsinki; Copenhagen; Gothenburg and all inland destinations. (Carting at T.P. No. 1). | 4/9 |
| 26/8 | Eagle Nova | F.F.C. Co. | Jeddah; P. Sudan; Hodeidah. (Carting at Timber Pond No. 1). | 31/8 |
| 30/8 | Dorothee (Ger) | Samrat/ Hindustan/ | Felixstowe; Hamburg; Rotterdam; Also London; Liverpool; Leixoes; Lisbon; Manchester; Avonmouth; Wembly; Birmingham; Leicester; Le Havre; Bremen; Amsterdam; Antwerp; Copenhagen; Leeds; Aarhus; Gothenburg; Oslo; Helsinki; Stockhom; Belfast and all destinations in U.K., Benelux; Germany; Italy; France; Switzerland; and Austria. (Carting at M.O.D. No. 1 for Samrat & Hindustan). | 5/9 |
|  |  | Killick | Felixstowe; Rotterdam; Hamburg; Antwerp; Le Havre; Lisbon; Leixoes; London; Liverpool; Manchester; Bristol; Avonmouth; Leeds; Glasgow; Tilbury; Birmingham; Dublin; Belfast; Bremen; Bremerhaven; Aarhus; Gopenhagen; Gothenburg; Helsinborg; Oslo; Helsinki; Alexandria; Lattakia; Mersin; Malta; Limmassol; Piraeus. (Carting at E-Shed Grain Depot). |  |
| 30/8 | Robert E Lee | M.S.P.L. | Assab; P. Suez; (Alexandria). (Carting at P/Q-PD). | 30/8 |
| 26/8 | Eagle Nova | F.F.C. Co. | Colombo; Rangoon. (Carting at Timber Pond No. 1). | 31/8 |
| 26/8 | Maersk Clementine (Sing)(V-9017) | Maersk Agency | Penang; Singapore; Hongkong; Keelung; Kaohsiung; Busan; Main Japan Ports; Manila; Jakarta; Surabaya; Bangkok; P. Kelang; Chinese Ports. (Carting at M.O.D. No. 2). | 30/8 |
| Stream | Putvil (Rus) | Transocean | Singapore; Kobe; Yokohama. | 31/8 |
| 26/8 | Eagle Nova (V-019) (Ger) | F.F.C. Co. | Penang; P. Kelang; Singapore; Bangkok; Jakarta; (T. Priok), Hongkong; Manila; Busan; Keelung; Kaohsiung; Kobe; Yokohama; Nagoya; Osaka; Tokyo; Tsingtao; Dairen; Quangzhou; Whampoa; Shanghai; Hsingkang. (Carting at Timber Pond No. 1). | 31/8 |
| 30/8 | Robert E Lee | M.S.P.L. | Singapore; P. Kelang. (Carting at P/Q-PD). | 30/8 |
| 36/8 | Eagle Nova | F.F.C. Co. | Brisbane; Fremantle; Sydney; Melbourne; Adelaide. |  |

| (2) | (3) | (4) | (5) |
|---|---|---|---|
| Eagle Nova (V-019) | F.F.C. Co. | Dubai; Sharjah; Abu Dhabi; Doha; Muscat; Dammam; Riyadh; Bahrain; Kuwait. (Carting at Timber Pond No. 1). | 31/8 |
| Gulf Spirit | Jades Ship | Dubai; Sharjah. | 30/8 |
| Rashida | U.L.A. | Dubai; Bahrain; Doha; Dammam; Abu Dhabi; Muscat. | 29/8 |
| Maersk Clementine | Maersk Agency | Dubai; Dammam; Muscat; Bahrain; Kuwait; Riyadh; Doha. (Carting at M.O.D. No. 2). | 30/8 |
| Vishva Kaumudi (Ind) | S.C.I. | Seychelles; P. Louis; Mombasa; Dar Es Salaam; Beira. (Carting at T.P. No. 1). | 7/9 |

## VESSELS DUE FOR IMPORT DISCHARGE

| Date | Steamer's Name | Agents | From |
|---|---|---|---|
| | Ann | Swan Ship | Malaysia |
| | Dorothee | Samrat | U.K. Cont. |
| | Ind. Renown | I.S.S. Co. | U.K. Cont. |
| | Robert E Lee | M.S.P.L. | U.S.A. |
| | S/o. Andhra Pradesh | S.C.I. | U.S./Canada |
| | Vishva Shakti | S.C.I. | Med. Ports. |
| | Vrontados | Sai Ship | S. America |
| | Vishva Parimal | S.C.I. | U.K. Cont./U.S. |

Ahura

SPELLS QUALITY
SELLS QUALITY

82, MAHAKALI ROAD, ANDHERI (EAST), BOMBAY 400 093.

FOR YOUR REQUIREMENTS OF:

**1. NICKEL-ALUMINIUM ALLOY POWDER**
**50:50; UPTO 300 MESH**
**2. RANEY NICKEL CATALYST (ACTIVE)**
**READY-TO-USE; IN WATER SUSPENSION**

**(Also available Molybdenum promoted Raney Nickel catalyst)**

Contact Manufacturers

**VINEETH CHEMICALS**

C/14, Nand-Jyot Industrial Estate, Safaid Phool, Kurla-Andheri Road, Bombay 400 072.
**Phones: Office: 5120777 Residence: 02523-2844 (Vasai Exchange)**

For your requirements of PHARMA GRADE

ETHYL OLEATE
E.D.T.A. ACID & SALTS
S.L.S. POWDER
GLYCINE
BENZYL BENZOATE
ETHYL PALMITATE
FERRIC SODIUM E.D.T.A.
SODIUM LAURYL SARCOSINATE
B.H.T.
BENZYL SALICYLATE

Please Contact Manufacturers
**Mr. VIKAS SANDU**

SANDU PHARMACEUTICALS & CHEMICALS

'ANAND', 7TH ROAD, SANDU WADI, CHEMBUR, BOMBAY 400 071.
**Tel.: 555-4941**
*Office Hrs.: 9.00 a.m. to 1.00 p.m. ONLY*

**FILTROLL**

**(Props: THE BANGALORE PAPER & PULP MILLS)**
(SPECIALISTS IN ALL TYPES OF FILTER PAPER & CLOTHS)
All Kinds of Processing Industries
**Washing & Cleaning Agents, Beverage & Foodstuffs, Paint and Beer and Distillery, Transformer Oil, Dyes and Chemicals, Pharmaceuticals etc.**
Available From Ready Stock:
**LITMUS GRANULES, LITMUS PAPER, SILVER ESTIMATOR & INDICATOR PAPER**

CONTACT: **FILTROLL (INDIA)**

**Sales Office:** 105, Princess Street, Damodar Blg., 1st Floor, Bombay-400 002. **Tel: 310817**
**Calcutta Branch:** 48, Canning St., Janaki Centre, 1st Flr., Rm. No. 106, Calcutta-700 001. **Tel: 42228**
**Factory:** Plot No. 57/A, Bommasandra Indl. Area, Post: Bommasandra, Bangalore-562 158
**Bangalore Office:** Anandaram Complex, 565, Avenue Road, 2nd Floor, Next to Syndicate Bank, Bangalore - 560 002. **Phone: 75745**

# Materials Imported/Exported

## MATERIALS EXPORTED BOMBAY

### 13.2.90 to 15.2.90

ALPHA NAPHTHYLAMINE: To aka: Sahyog Chemicals, 5,000 Kgs., : 3,31,915.

ALUMINIUM FLUORIDE: To elborne: Navin Fluorine Indus., 250 gs., Rs. 41,48,936.

2:4 DINITRO CHLORO BEN- NE: To Osaka: Chemiesynth Private mited, 16,500 Kgs., Rs. 3,23,211.

FLUORESCENT BRIGHTNER: To njung Ori: Indian Dyestuff Inds. Ltd., 00 Kgs., Rs. 1,03,000.

GAMMA ACID: To Odessa: Usha ercontinental, 12,000 Kgs., . 14,05,560.

H.ACID: To Busan: Priya Electron- & Chemicals, Rs. 15,050 Kgs., . 11,13,066; To New York: H & H ernational 16,025 Kgs., Rs. 87,977.

HYDROCHLORIC ACID: To Sin- pore: Muhi Trading Corpn., 19.600 TS., Rs. 41,395.

META NITRO ANILINE: To Kobe: ndustan Oil Corporation Limited 204 Kgs., Rs. 8,30,295.

META NITROBENZENE SODIUM LPHONATE: To Hong Kong: van Products, 2,000 Kgs. 65,872.

META UREIDO ANILINE: To Sin- ore: Liberty Exports Ltd., 2,400 s., Rs. 2,31,489.

NICOTINE SULPHATE: To Yoko- na: Nicto India Corpn., 5,000 Kgs., 3,07,557.

ORTHO DI CHLORO BENZENE: Keelung: Chemie Organic, 19,800 s., Rs. 2,50,000.

RED IRON OXIDE; To Bangkok: ective Munichem & Colour Inds., 00 Kgs., Rs. 83,250; To Singapore: Selective Munichem & Colour Inds., 20,000 Kgs., Rs. 30,693.

SCHAEFFERS ACID: To Kobe: Mahalaxmi Chem. Works, 4,406 Kgs., Rs. 2,58,468.

SODIUM PHOSPHATE DI (ANHYDROUS): To Singapore: Liberty Export Ltd., 1,000 Kgs., Rs. 22,636.

SULPHO TOBIAS ACID: To Bangkok: Vivid Exports, 4,785 Kgs., Rs. 2,74,101; To Singapore: Liberty Exports Ltd., 3,252.93 Kgs., Rs. 2,46,510.

VINYL SULPHONE CRESIDINE BASE: To Jakarta: Liberty Exports Ltd., 1,082 Kgs., Rs. 3,89,787.

## DYE MATERIALS EXPORTED BOMBAY

### (From 13.2.90 to 15.2.90)

ACID BLACK 10 BX: To Kobe: Karsandas Mavji, 3,000 Kgs., Rs. 2,84,489.

ACID BLUE: To Busan: Brinda Export Agencies, 150 Kgs., Rs. 38,400.

ACID GREEN V: To Yokohama: Mahalaxmi Chemical Works, 300 Kgs., Rs. 94,774.

ACID PATENT BLUE: To Busan: Meha Impex P. Ltd., 500 Kgs., Rs. 1,11,064.

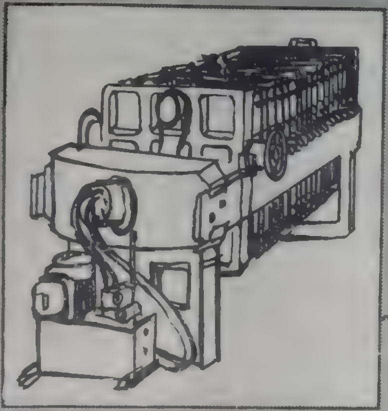
ACID RHODAMINE B 400: To Keelung: Brinda Export Agencies, 400 Kgs., Rs. 1,62,000.

ACID RHODAMINE B SUPRA: To Busan: Mahalaxmi Chemical Works, 500 Kgs., Rs. 2,01,106.

ACID RHODAMINE B SPECIAL: To Yokahama: Mahalaxmi Chemical Works, 1,300 Kgs., Rs. 7,32,766.

ACID YELLOW 5 GN: To Busan: Mahalaxmi Chemical Works, 500 Kgs., Rs. 1.29.481.

Available In All Size



FILTER PRESS, WOODEN
FILTER PLATE & FRAME

WOODEN VATS, TUBS/ TANKS
OF ANY LITRE CAPACITY

MADE FROM BURMA, VALSADI TEAK WOOD & SALWOOD

Contact Manufacturers

**SHREE RANG SAW MILL**
R.P. Desai Compound, Chimodia Naka, Bilimora - 396321 Dist. VALSAD
Gujarat. Phone : (O) 3713; (F) 3166 (R) 2607

ARLANTHRENE GOLDEN YELLOW: To Odessa: Arlabs Ltd., 3,010 Kgs., Rs. 6,47,150.

FAST SCARLET EX RC BASE: To Santos: Amritlal Chemaux Ltd., 5,000 Kgs., Rs. 5,10,638.

DYESTUFFS: To Chittagong: Atic Industries, 250 Kgs., Rs. 38,962; 1,000 Kgs., Rs. 5,15,864, 260 Kgs., Rs. 1,28,962; 1,000 Kgs., Rs. 3,35,864; Associated Intermediates, 1,000 Kgs., Rs. 1,77,000; Gateway International, 15,000 Kgs., Rs. 2,58,000; 500 Kgs., Rs. 86,000; Jay Chemical Industries, 1,000 Kgs., Rs. 83,000; To Karachi: Archana Finance Corpn., 3,000 Kgs., Rs. 2,79,000; Highland Dye Works, 1,900 Kgs., Rs. 1,50,000; 150 Kgs., Rs. 10,450; 150 Kgs., Rs. 10,450; 1,900 Kgs., Rs. 1,50,000; 2,050 Kgs., Rs. 1,50,000; Little & Co., 2,000 Kgs., Rs. 1,34,000; To Melbourne: Sudarshan Chem Inds., 300 Kgs., Rs. 46,853; To Odessa: Associated Dyestuff Industry, 6,000 Kgs., Rs. 2,55,000.

DYES: To Bangkok: Bhoir Imports Exports P. Ltd., 1,000 Kgs., Rs. 1,91,489; 1,000 Kgs., Rs. 1,14,895; K. Patel Chemo Pharma P. Ltd., 3,000 Kgs., Rs. 1,20,000; To Busan: Mangalya Trading & Investments Ltd., 1,000 Kgs., Rs. 96,000; 200 Kgs., Rs. 33,000; 300 Kgs., Rs. 35,000; Ravi Chem Dye, 1,000 Kgs., Rs. 1,14,894; Space International, 1,000 Kgs., Rs. 1,14,468; 1,000 Kgs., Rs. 1,43,404; To Hong Kong: Ind. Dyestuff Inds. Ltd., 5,000 Kgs., Rs. 5,33,000; To Jakarta: Bhoir Imports Exports P. Ltd., 4,000 Kgs., Rs. 4,02,127; 2,000 Kgs., Rs. 1,97,446; 1,000 Kgs., Rs. 31,914; To Keelung: Ravi Chem Dye, 300 Kgs., Rs. 1,27,660; To Odessa: Usha International, 2,500 Kgs., Rs. 10,22,500; 3,000 Kgs., Rs. 8,97,000.

DYES: To Bangkok: Jay Chemical Industries, 5,000 Kgs., Rs. 2,25,000; To Busan: Associated Intermediates & Chemicals, 1,000 Kgs., Rs. 1,20,000; 1000 Kgs., Rs. 1,77,000; To Charleston: Colori International, 2,000 Kgs., Rs. 3,94,043; Jansons Internation
12,500 Kgs., Rs. 13,51,488; To Jaka
Jaysynth Dyechem Ltd., 4,875 K
Rs. 72,26,510; To Hong Ko
Monarch Dyestuffs Inds., 2,000 K
Rs. 1,65,100; 3,000 Kgs., Rs. 2,70,6
To Charleston: Amritlal Chemaux L
1,000 Kgs., Rs. 6,34,431; 5,000 K
Rs. 24,96,109; JBF Industries L
3,000 Kgs., Rs. 4,76,596; To Odes
Arlabs Ltd., 4,050 Kgs., Rs. 16,60,5
Usha International, 5,000 Kg
Rs. 6,30,000; To Singapore: Arl
Ltd., 500 Kgs., Rs. 2,83,234.

DYE INTERMEDIATES:
Odessa: Associated Dyestuff Indus
23,000 Kgs., Rs. 9.77,500; 3,000 K
Rs. 1,27,500; Indian Chemicals In
13,000 Kgs., Rs. 5,52,500; To
Louis: Orion Traders, 2,250 K
Rs. 25,400; To Singapore: Sanjay S
Corpn., 2,000 Kgs., Rs. 2,73,151;
Sydney: Jay Chem Industries, 1
Kgs., Rs. 1,80,000; To Bangkok:
Products Ltd., 2,940 Kgs., Rs. 3,45,
Vivid Exports, 2,301 K
Rs. 5,92,545; To Busan: Mag
Chemicals P Ltd., 4,000 K
Rs. 4,10,000; To Jakarta: Espee Ch
icals, 11,702 Kgs., Rs. 10,15,268;
Keelung: Liberty Exports Ltd., 1
Kgs., Rs. 1,70,213; To Keelung: V
Exports, 6,600 Kgs., Rs. 4,26,704
Kobe: Metro Chem Inds., 9,181 K
Rs. 9,48,834; To Odessa: Amar
Chem Ltd., 16,650 Kgs., Rs. 19,31,
Bubric Enterprises, 3,280 K
Rs. 6,40,900; Sharda Intl., 11,250 K
Rs. 13,30,160; 27,100 K
Rs. 32,86,530; Usha Intercontine
16,000 Kgs., Rs. 13,20,000; To Si
pore: Liberty Exports Ltd., 4,827 K
Rs. 4,64,680; To Yokohama: ID
Mts., Rs. 4,09,000; Sunbeam M
chem P. Ltd., 4,663 Kgs., Rs. 4,54
Sunbeam Monochem P. Ltd., 2
Kgs., Rs. 3,71,983; 2,425 K
Rs. 2,26,945; 4,293 Kgs., Rs. 3,8

PHTHALOCYANINE GREEN
Melbourne: Sudarshan Chemical I
1,000 Kgs., Rs. 1,71,207.

REACTIVE BLUE 25: To Sa

AVAILABLE

CONC: NITRIC ACID (98.5%)
DILUTE NITRIC ACID 60%
FORMIC ACID (85%)

Manufactured by:

GUJARAT NARMADA FERTILIZER CO. LTD.

CONTACT FOR YOUR REQUIREMENTS:

CHEMOX CHEMICAL INDUSTRIES LTD.
Pooran Asha Building 317, Narsi Natha Street, Bombay-400 009.
Phone: 335061 (10 LINES) Gram: 'NCHEMOX
Telex: 11-76723 CHMX IN Fax: 91-22-855 89 38

: Jansans International, 1,500 Kgs., 1,51,063.

EACTIVE BRILLIANT BLUE : To Singapore: Chika Ltd., 2,000 ., Rs. 2,10,383.

EACTIVE RED 11: To Singapore: ir Imports Exports P. Ltd., 1,000 ., Rs. 1,25,957.

EACTIVE RED 31: To Singapore: ir Imports Exports P. Ltd., 1,000 ., Rs. 1,49,787.

EACTIVE TURQUOISE BLUE 5 . RH-19: To Jakarta: Jaysynth chem Pvt. Ltd., 4,950 Kgs., Rs. ,574.

EACTIVE YELLOW 17: To Charon: Jansons International, 1,500 ., Rs. 3,76,171.

ED RGR EX CONC.: To Karachi: our-Chem Ltd., 2,000 Kgs., 1,74,720.

HODAMINE PINK: To Port Louis: n Traders, 240 Kgs., Rs. 10,500.

OLUIDINE RED 405: To Melne: Sudarshan Chem. Inds., 500 , Rs. 83,000.

---

## MATERIALS IMPORTED BOMBAY

## (From 1.5.90 to 14.5.90)

---

CETOPHENONE 99%: From : Industrial Perfumes Ltd., 3,000 , Rs. 67,096.

CRYLAMIDE: From UK: Greaves on & Co. Ltd., 1,000 Kgs., 6,177.

CRYLIC ACID: From Japan: Pididus. Ltd., 1,000 Kgs., Rs. 26,177.

DIPIC ACID: From Malaysia: ate Palmolive (I) Ltd., 3,000 Kgs., 3,870.

EROSIL 200: From Belgium: AP nicals, 1,860 Kgs., Rs. 2,26,907; n Gum Inds. Ltd., 1,860 Kgs., ,26,907.

LDEHYDE C-13: From Switzer- Seth Brothers Pvt. Ltd., 20 Kgs., Rs. 7,458.

ALPHA ACETO BUTYRO LACTONE: From Japan: IDPL Ltd., 30,000 Kgs., Rs. 44,64,104.

D-ALPHA PHENYL GLYCINE HYDROCHLORIDE: From Malaysia: Colgate Palmolive, 11,550 Kgs., Rs. 47,36,747; From Netherlands: Armour Chemicals Ltd., 5,775 Kgs., Rs. 23,46,658; Ranbaxy Labs. Ltd., 11,500 Kgs., Rs. 47,36,747; From Taiwan: Armour Chemicals Ltd., 9,000 Kgs., Rs. 23,95,205.

AMINO ANISIC ACID ANILIDE: From Japan: Colour Chem Ltd., 500 Kgs., Rs. 1,75,883.

AMMONIA ANHYDROUS: From UAE: Rashtriya Chemicals Fertilisers, 4,505 Mts., Rs. 1,04,20,004.

AMM. DIHYDROGEN PHOSPHATE: From Japan: Punsumi India Ltd., 275 Kgs., Rs. 16,344.

AROMATIC CHEMICALS: From FRG: Industrial Perfumes Ltd., 50 Kgs., Rs. 37,951; From Switzerland: Seth Brothers Private Limited, 30 Kgs., Rs. 11,287.

BLEACHING EARTH ACTIVATED: From Singapore: Darshan Oils Pvt. Ltd., 17 Mts., Rs. 1,09,769; From Indonesia: Transworld Exp. & Imp., 17 Mts., Rs. 1,06,803; From FRG: Hanuman Vitamin Foods Ltd., 17,000 Kgs., Rs. 1,28,754; M.P. Oils Fats Ltd., 17 Mts., Rs. 1,28,753; From Malaysia: Colgate Palmolive (I) Ltd., 119 Mts., Rs. 6,98,588.

BROMINE LIQUID: From Israel: Skylead Chemicals Pvt. Ltd., 134 Kgs., Rs. 2,93,080.

BUTACHLOR TECHNICAL: From Malaysia: Colgate Palmolive (I) Ltd., 1,90,200 Kgs., Rs. 43,74,406; From Taiwan: Bharat Pesticide Manufacturings, 15,600 Kgs., Rs. 6,44,941; From USA: Jai Chemicals, 34,920 Kgs., Rs. 6,90,453; Herbicide India Ltd., 69,840 Kgs., Rs. 13,40,686.

FILTER CLOTHS
FILTER CLOTHS

In Cotton. Nylon. Acrylic polyester Fibre polypropylene. P.V.A., P.V.C. are manufactured in over 400 Varieties and also Supplied as per your specifications and requirements. prices are competitive.

Our full-fledged technical department is ready to assist you.

Please contact for further details and sample.

**BHARAT INDUSTRIAL CORPORATION**

TELEX: 011-72262 DRAG IN

90, BHAJIPALA LANE TAVAWALA, BLDG BOMBAY 400 003.
GRAM "BHARATTUBE", BOMBAY - 400 003
PHONE 341920, 341869, 335759 ■ RESI. 6134142

BUTANOL: From FRG: Bayer (I) Ltd., 1,050 Kgs., Rs. 69,170.

BUTANOL G FATTY ALCOHOL: From FRG: Bayer (I) Ltd., 1,050 Kgs., Rs. 69,170.

BUTYLATED HYDROXY ANISOLE: From Japan: Dhiraj Enterprises, 500 Kgs., Rs. 1,17,797.

CAPROLACTAM: From Belgium: JCT Ltd., 1,07,400 Kgs., Rs. 31,86,277; From Netherlands: Century Enka Ltd., 2,60,000 Kgs., Rs. 75,72,928; From Spain: JCT Ltd., 652 Mts., Rs. 1,87,54,740.

CARBON BLACK: From Malaysia: Colgate Palmolive, 360 Kgs., Rs. 77,356; From USA: Modi Xerox Ltd., 33 lbs., Rs. 1,83,406.

CETYL ALCOHOL C-16: From Malaysia: Colgate Palmolive (I) Ltd., 1,000 Kgs., Rs. 37,106.

3 CHLOROPROPYL METHYL DI METHOXY SILANE: From Japan: Reliance Silicone (I) Pvt. Ltd., 48 Kgs., Rs. 20,941; Reliance Silicone (I) Pvt. Ltd., 48 Kgs., Rs. 20,941.

N-CHLOROSUCCINIMIDE: From Malaysia: Colgate Palmolive (I) Ltd., 2,000 Kgs., Rs. 3,90,392.

CINAMIC ALCOHOL: From FRG: The Tata Oil Mills Co. Ltd., 250 Kgs., Rs. 36,075.

CITRIC ACID MONOHYDRATE BP: From Malaysia: Colgate Palmolive (I) Ltd., 17,500 Kgs., Rs. 2,29,050.

CYCLOHEXANONE: From FRG: Columbia Electronics Ltd., 13,300 Kgs., Rs. 3,29,770.

CYCLOHEXYL ISOCYANATE: From FRG: Harind Pharml., 19.8 Kgs., Rs. 13,145.

3-CYANOPYRIDINE: From USA: Veer Chemie Aromatics Pvt. Ltd., 7,000 Kgs., Rs. 4,76,423.

2-CYANOPYRAZINE: From Japan: Pharmachem, 600 Kgs., Rs. 3,58,09

D-CAMPHOR SULFONIC ACID From Taiwan: Wockhardt Ltd., 2,50 Kgs., Rs. 5,12,635.

DANE SALT: From Singapore Armour Chemicals Ltd., 3,000 Kgs Rs. 11,24,438; Nikhil Drugs & Chemicals Pvt. Ltd., 1,000 Kgs., Rs. 3,66,48 Gujarat Lyka Organics Ltd., 2,000 Kgs Rs. 7,67,862; Pharmachem, 1000 Kgs. Rs. 3,75,173.

DESMODUR 44: From FRG: Milto Plastics, 18,000 Kgs., Rs. 5,96,838.

DIALLYL PHTHALATE: Fro UK: Bakelite Hylam Ltd., 1,100 Kgs Rs. 76,654.

DIARYL SULPHIDE: From USA Deewam Rubber Inds., Ltd., 17.76 Mts., Rs. 3,36,105.

DICARBOXYLIC ACID: Fro FRG: Colour Chem Ltd., 15,375 Kgs Rs. 2,81,347.

DICHLOROACETONE: From UK Globe Organics Ltd., 2,000 Kgs Rs. 10,23,385.

DICHLORO NAPHTHALEN DIONE: From Japan: Reine Chemical 500 Kgs., Rs. 77,176.

DICOFOL: From Italy: Indof Chemicals Co., 9,000 Kgs Rs. 7,85,313.

DICYANIDIAMIDE: From Hor Kong: Explogel India, 34 Mts Rs. 9,31,556; 34 Mts., Rs. 9,31,556.

DL-MANDELIC ACID: Fro Japan: Selectochem, 1,000 Kg Rs. 1,58,162.

DL-METHIONINE: From Franc Akola Chemicals (India), 5,000 Kg Rs. 2,18,142.

DIPHEYL METHANE DI ISOC ANATE: From FRG: Expanded Inco poration, 18,000 Kgs., Rs. 5,96,838

DIPHENYL OXIDE: From Malasia: Colgate Palmolive, 4,000 Kgs., 1,32,630.

Available

META CHLORO ANILINE

(Minimum Purity 99%)

For Local and Export

For further details please contact:

Valiant Chemical Corporation

For Local:
Mr. Arvind Chheda/Mr. H.L. Gala
5, Chheda Bhavan, 98, Surat Street,
Bombay-400 009.
Phone: 863618, 862620, 8550245, 8555639, 8511698

For Export:
Mr. Manoj Chheda/Mr. Mahesh Vikam
Plot No. 74, Matru Smriti, Road No. 4,
Scheme No. 6, Sion (East), Bombay-400 022.
Phone: 4072435, 4077431, 4077432, 4077433
Telex : 011-73254 ALAB IN
Fax : 022-4075524

DIMETHYL ACETAMIDE: From JSA: Glaxo India ~~Ltd.~~, 14,043 Kgs., s. 3,79,697.

DIMETHYLDICHLOROSILANE: rom FRG: Dr. Beck & Co. (I) Ltd., ,000 Kgs., Rs. 1,00,869.

DIMETHYL FORMAMIDE: From apan: Aquapharm Chemicals Co. Pvt. td., 15,200 Kgs., Rs. 2,29,005; From JK: Greaves Cotton & Co. Ltd., 15,200 gs., Rs. 2,36,316.

DIMETHYL SUCCINYL SUCCI-ATE: From Japan: Sudarshan Chemcals Inds., 10,000 Kgs., Rs. 1,97,973.

DIMETHYL SULFOXIDE: From JSA: Metrox Fine Chemicals Private imited, 1 Lbs., Rs. 2,62,980; Roche roducts Limited, 18,000 Kgs., Rs. ,20,586.

EPICHLOROHYDRINE: From apan: Hexagon Lab India, 3,120 Kgs., s. 86,736; Surchi Chemicals, 12,000 gs., Rs. 2,51,300.

ETHYL GLYCOL ACETATE: rom USA: Beck & Co. (I) Ltd., 10,000 gs., Rs. 2,44,320.

ETHYL THIO ETHANOL: From elgium: Rajasthan Glyoxal Ltd., 4,4-0 Kgs., Rs. 1,76,608; Yash Pharma ab., 5,000 Kgs., Rs. 1,08,360.

FERRIC ACID: From FRG: Daulat lectronics Ltd., 3,200 Kgs., s. 2,76,430; 3,200 Kgs., Rs. 2,76,430.

FURFURYL ALCOHOL: From alaysia: Colgate Palmolive (I) Ltd., ,920 Kgs., Rs. 61,064; From USA: olychem Inds., 2,160 Kgs., Rs. 68,793; olyceramic Inds., 2,160 Kgs., s. 68,793.

GAMMA FERRIC OXIDE: From RG: Daulat Electronics Ltd., 16,000 gs., Rs. 13,92,150.

GUM ROSIN: From China: Shree utta Shetakari Sahakari, 36 Mts., s. 2,79,540; From Indonesia: Elphintone Paints & Colour Mfg., 18 Mts., s. 1,58,633; Resins & Plastics Ltd., 36 Its., Rs. 3,14,125; Resin & Plastic Pvt. Ltd., 18 Mts., Rs. 1,58,634.

GUM ROSIN N GRADE: From China: Phosphate Products Pvt. Ltd., 36,000 Kgs., Rs. 3,16,268.

GUM ROSIN WG GRADE: From Indonesia: Vijay Varnish Co., 36 Mts., Rs. 3,09,159; From Malaysia: Colgate Palmolive (I) Ltd., 75 Kgs., Rs. 1,67,063.

HEAT TRANSFER OIL SYNTHETIC: From UK: Synthetics & Chemicals Ltd., 16.400 Mts., Rs. 5,29,476; From USA: IPCA Labs Ltd., 10,126.62 Kgs., Rs. 3,79,956.

HEXA BROMOCYCLODECANE: From UK: Mcdowell & Co., 1,380 Kgs., Rs. 1,53,156.

HEXA CHLOROCYCLO PENTADIENE: From USA: Bharat Pulverising Mills, 26,671 Kgs., Rs. 8,51,767; Excel Industries, 209 Mts., Rs. 98,07,907.

N-HEXANE 99%: From FRG: Spectrochem Pvt. Ltd., 264 Kgs.,Rs. 29,351.

HYDROXYLAMINE SULPHATE: From Japan: Ranbaxy Labs Ltd., 5,000 Kgs., Rs. 1,48,337.

ISOBORNYL CYCLO HEXANOL: From Malaysia: Colgate Palmolive (I) Ltd., 2,000 Kgs., Rs. 3,56,008.

ISOPHTHALIC ACID: From Belgium: Jewel Polymers Pvt. Ltd., 10,000 Kgs., Rs. 1,60,553.

ISOPHORONE: From Malaysia: Colgate Palmolive Ltd., 3,420 Kgs., Rs. 66,942; From Japan: Sebro Art Printers, 6,080 Kgs., Rs. 1,31,570.

LAMP BLACK: From FRG: Modi Rubber Ltd., 88.8 Kgs., Rs. 21,552.

LINALOOL: From Japan: J.B. Perfumes Pvt. Ltd., 1,360 Kgs., Rs. 1,91,095.

LILIAL: From Malaysia: Colgate Palmolive (I) Ltd., 3,040 Kgs., Rs. 9,06,004.

MDI: From FRG: Expanded Incorporation 18,000 Kgs., Rs. 5,96,838.

AMMONIUM NITRATE (RCF Melt)
AMMONIUM MOLYBDATE
CALCIUM NITRATE
CALCIUM STEARATE
MAGNESIUM NITRATE
MAGNESIUM OXIDE
POTASSIUM IODIDE/IODATE
SODIUM MOLYBDATE
STRONTIUM CHLORIDE
ZINC OXIDE (White Seal/Off Grade)

YOGI
YOGI
DYE CHEM
INDUSTRIES

403, 'YOGESHWAR', 135, KAZI SYED STREET, BOMBAY-3
TEL. : 326542-331195 RES. 6135908, GRAM SULPHATES

FOR YOUR REQUIREMENTS OF
(Available in Drums & in Tanker Load)

TOLUENE (N.G.)
BENZENE (N.G.)
XYLENE (Ortho/Para/Mix)
SOLVENT C-IX (Crude/Distilled)
METHANOL
FORMALDEHYDE 37%
ACRYLONITRILE
ACETONITRILE
N-HEXANE (Food Grade)

I.P.A.
DIACETONE
ACETONE
MIBK
BUTANOL (Iso/Normal)
P.E.G.
D.E.G.
M.E.G.
M.E.K.

METHYLENE CHLORIDE
FORMIC ACID
HYDROGEN PEROXIDE
PROPYLENE GLYCOL
PHENOL (Liquid/Crystal)
E.D.C.
MONOMERS &
OTHER INDUSTRIAL CHEMICALS

Please Contact:

**GAYATRI ENTERPRISES**

341/43, Katha Bazar, N.N. Street, Bombay 400 009.
Tel.: (O) 339744, 329188 (R) 5136564, 5132747

---

CONTACT FOR YOUR PACKING PROBLEMS
Available Regularly At Most Competitive Rates in any QUANTITIES

**SECOND-HAND/ONCE USED, H.D.P.E. JERRYCANS CARBOYS AND BARRELS**
OF VARIOUS QUALITY AND ALSO IMPORTED SIZE AVAILABLE

(Narrow mouth): 20, 30, 50 (Rocket type) and 100 Kg. capacity
(Wide mouth): 50, 80 and 200 (Blue) Kg. capacity

We are also interested in disposable carboys

Write to

**BOX NO. 1260**

CHEMICAL WEEKLY
306, Shri Hanuman Industrial Estate, G.D. Ambekar Road, Wadala, Bombay 400 031.

---

For Your Requirements Of:

**FERRIC CHLORIDE (Anhydrous 98%)**
**FERRIC CHLORIDE (LUMPS)**

Please Contact Manufacturers

**NAVJEEVAN-O-CHEM**

Regd. Office :
Gawand Building, Khema Lane
Jambli Naka, Thane 400 601
Phone : 503593

Factory
Plot No. 5903-1, GIDC
Ankleshwar 393 002 Dist: Bharuch
Phone : 2938

**M.E.K. PEROXIDE**
**BENZOYL PEROXIDE**

QUALITY * RELIABILITY * CONSISTENCY

Manufacturers

**ROMA CHEM INDUSTRIES**

**Regd. Office:** 22/1044, Punjabi Colony, G.T.B. Nagar, Bombay 400 037.
**Phones:** 4073074/4092216/4093914 **Resi.:** 483095
**Sales Office:** Municipal Building, C-1, Shop No. 2 & 3,
Near Sardar Nagar, No. 4, G.T.B. Nagar, Bombay 400 037.

---

For Your Regular Requirements Of:

- GUANIDINE NITRATE
- SULPHA GUANIDINE
- SULPHA DIMIDINE
- DINITOLMIDE (D.O.T.)
- SODIUM METHOXIDE POWDER
- SODIUM METAL
- ACETONE
- BENZENE
- TOLUENE
- XYLENE
- CYCLOHEXANONE
- DICYANDIAMIDE
- EPICHLOROHYDRINE

Please Contact:

SUDHIR

**SUDHIR CHEMICAL INDUSTRIES**

208, Faiz E Qutbi, 375, Narsinatha Street, Bombay 400 009.
**Tel.:** 333605/343391 **Resi.:** 0215-681182
**Telex:** 011-76729 RCSC IN **Gram:** "SUDHICHEMI"

---

SPECIAL PRICE FOR BULK QUANTITY

**TETRA BUTYL AMMONIUM BROMIDE**
**TETRA ETHYL AMMONIUM BROMIDE**

BUTYL TRIETHYL AMMONIUM BROMIDE (Triethyl Butyl Ammonium Bromide)
BENZYL TRIETHYL AMMONIUM CHLORIDE (Triethyl Benzyl Ammonium Chloride)
BENZYL TRIETHYL AMMONIUM BROMIDE (Triethyl Benzyl Ammonium Bromide)

Contact Manufacturers & Exporters

**HEM CORPORATION** Phone: 252250, 319990
7-Devkaran Mansion, 24/B-Vithaldas Road, Princess Street, Bombay 400 002.

---

● ready stock **BORON TRIFLUORIDE dimethyl ether** (methyl ether)

Ion Exchange Resins
Water Treatment Plants & Chemicals
Reverse Osmosis Plant

Anthrecite Powder
1:4 Butanediol (German)
Behenyl Alcohol
Geranium Oil
Lanasyn Green 5GL Acid Dyes
2 Methyl Chloro Propionate
Neopentyl Glycol
Neozopon Orange 245

Neozopon Yellow 157
Nylosan Scarlet 4G 125%
Nylosan Scarlet F 36L
N. Methyl Pyrrolidone
Polyol, T.D.I. & M.D.I. for Polyurethane & Rigid Foam
Solsperse (ICI)
Triethanolamine Lauryl Sulphate

Vestowax SH 105
Please Contact:

**M/s. DOSHI & COMPANY**

7, Premjivan, 87, Kazi Sayed Street, Khand Bazar, Bombay 400 003.
Phones: 343480 Resi.: 455147/462564
Gram: DHIRENCHEM, Dadar, Bombay.
Ahmedabad: Phone: 831156, 833302. Resi.: 407909

**ANISIC ALDEHYDE**

**NITROBENZENE * C.T.C. * CHLOROFORM**

**N-HEXANE * PHOSPHORIC ACID**

MMA Monomer
Cyclohexanone
Ethyl Cellosolve
Butyl Acetate
Butyl Cellosolve

N-Butanol
Toluene
Benzene
Xylene
Acetone/EDC

I.P.A./M.E.K.
M.I.B.K.
E.P. 60-80/40-60
Trichloroethylene
D.O.P./D.B.P.

**AJMERA CHEMICALS**
276/78, Samuel Street, 3rd Floor, R. No. 21, Bombay 3.
Ph.: 325756/332325 Resi.: 6825148

**Potash Alum - 99% Min.**

Basic Chromium Sulphate
Sodium Sulphide Flakes (Iron Free)
Potassium Carbonate
Barium Carbonate/Chloride
Calcium Chloride
Potassium Bromate
Sodium Bromate

**VORA CHEMI TRADE PVT. LTD.**

265, Samuel Street, Bombay 400 003.
Phones: 333762/63/64/325265/345377

# THE IDEAL SOURCE FOR CHEMICALS

AUTHORISED DISTRIBUTORS OF GNFC:

**FORMIC ACID 85%**

AUTHORISED DISTRIBUTORS OF R.C.F.:

**SODIUM NITRATE • SODIUM NITRITE**
**AMMONIUM-BI-CARBONATE • METHANOL**

AUTHORISED DISTRIBUTORS OF GSFC:

**MEK OXIME (ANTI-SKINNING AGENT)**

DEALER OF CENTURY RAYON:

**ANHYDROUS SODIUM SULPHATE**

DEALER OF HOC:

**ACETONE**
**PHENOL**

AUTHORISED STOCKIST OF TTP:

**TITANIUM DIOXIDE**

DEALER OF STANDARD ALKALI:

**CAUSTIC SODA LYE**

*"WE ARE GROWING STRONGER WITHOUT LOOSING OUR PERSONAL TOUCH"*

POPAWALA & CO.

1502, MAKER CHAMBERS V, 221, NARIMAN POINT, BOMBAY-400 021. INDIA
CALL: 23 01 56 • 24 45 93 • 287 11 15 TELEX: 011-4164 POP IN

dited by R. Raghavan and published by N.R. Rajagopalan on behalf of owners, Sevak Publications, 306, Shri Hanuman
ndustrial Estate, Wadala, Bombay 400 031. Madras Office: Room No. 9, Wellingdon Estate, 3rd Floor, 24, Commander-
-Chief Road, Madras 600 105. Phone: C/o. 471659 and printed by N.R. Rajagopalan at Sevak Publications, 25, North
ada Street, Thiruvanmiyur, Madras 600 041. Phone: 419265. Registered with the Registrar of Newspapers for India vide

R.N. NO. 1972/

ISSN 0045/6500

REGD. NO. TN/MS (C) 395

New generation plasticizer is here!

BENZOPLAST (TM)

The superior alternative to DOP

BENZOPLAST

Improves your quality.
Reduces your cost.

Leading manufacturers of PVC leather cloth plastisol, adhesive rubber products, PVC footwear, PVC tapes, films etc. are already using BENZOPLAST in place of DOP

For detailed information, booking orders and technical assistance contact our Marketing Division.

GANESH BENZOPLAST LTD.
145-A, Dr. Viegas Street, Kalbadevi Road, Bombay 400 002.
Phone: [illegible]

Benzoplast – perfects your products.

YEAR OF
PUBLICATION

ISSN 0045/6500
R. N. NO. 1972/57

SEP
C. F. T. R. I., MYSO

# Chemical Weekly

VOL. XXXV SEPTEMBER 4, 1990 NO. 52

New generation plasticizer is here!

**BENZOPLAST**(TM)

The superior alternative to DOP

**BENZOPLAST**(TM)

Improves your quality.
Reduces your cost.

Leading manufacturers of PVC leather cloth, PVC cables, plastisol, adhesive, rubber products, PVC footwear, PVC tapes, films, etc. are already using BENZOPLAST in place of DOP.

For detailed information, booking orders and technical assistance contact our Marketing Division.

**GANESH BENZOPLAST LTD.**
145-A, Dr. Viegas Street, Kalbadevi, Bombay 400 002
Phone: 317993, 253438, 298476. Telegram: BENZACID
Telex: 011-3906 GNES IN. Fax: 91(22) 2863768

*Benzoplast — perfects your products*

25
YEARS
1962-87

- Mono Sodium Phosphate Crystal
- Mono Sodium Phosphate Anhydrous
- Di Sodium Phosphate Crystal
- Di Sodium Phosphate Anhydrous
- Tri Sodium Phosphate Anhydrous
- Tetra Sodium Pyro Phosphate
- Acid Sodium Pyro Phosphate
- Mono Potassium Phosphate
- Di Potassium Phosphate
- Tetra Potassium Pyro Phosphate
- Mono Calcium Phosphate
- Mono Ammonium Phosphate Pure
- Di Ammonium Phosphate Pure
- Di Ammonium Phosphate Tech.
- Sodium Acetate Crystal
- Sodium Acetate Anhydrous
- Zinc Acetate
- Lead Acetate
- Potassium Acetate

ACCI

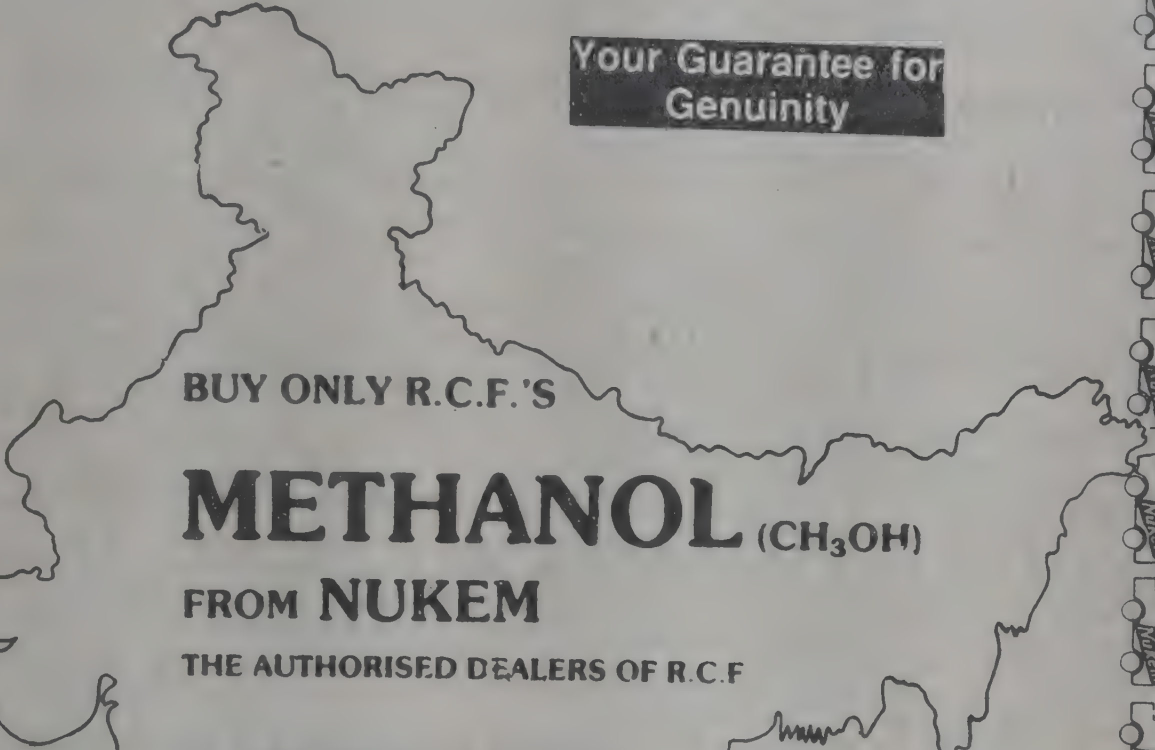
A. CHOKSEY CHEMICAL INDUSTRIES

101, M.G. ROAD, FORT, BOMBAY-400 023.
TELEPHONE: 273868, 274006
CABLE: HEXAPHOS ■ TELEX NO. 11-3716 PHOS IN

Edited by R. Raghavan and published by N.R. Rajagopalan on behalf of owners, Sevak Publications, 306, Shri Hanuman Industrial Estate, Wadala, Bombay 400 031. Madras Office: Room No. 9, Wellingdon Estate, 3rd Floor, 24, Commander-in-Chief Road, Madras 600 105. Phone: C/o. 471659 and printed by N.R. Rajagopalan at Sevak Publications, 25, North Mada Street, Thiruvanmiyur, Madras 600 041. Phone: 419265. Registered with the Registrar of Newspapers for India vide

SEE PAGE 39 FOR CONTENTS

7 SEP



Winners of "RCF AWARD FOR HIGHEST SALES" in Methanol for 1986-87

Your Guarantee for Genuinity

BUY ONLY R.C.F.'S

**METHANOL** ($CH_3OH$)

FROM **NUKEM**

THE AUTHORISED DEALERS OF R.C.F

WE OFFER UNIQUE DOOR-TO-DOOR
DELIVERY ANYWHERE IN THE COUNTRY.
EVEN AS LITTLE AS 2000 LITRES
IN OUR OWN FLEET OF TANKERS
A UNIQUE SERVICE TO OUR
VALUED CUSTOMERS

ESTD 1964

**Nukem Corporation**

P.O. BOX 16478 BOMBAY 400 016.
PHONES: 456648 • 453096 • 451951
GRAM: BROMINKING TELEX: 71009
FAX: 0091 (22) 468680

**METHANOL**
IS OUR BUSINESS SINCE TWO DECADES

Please Contact for Prompt Supplies Of:

**Anhydrous Ammonia Gas**

**IN CYLINDERS AND ROAD TANKERS**

**Also Available LIQUOR AMMONIA in Carboys and Tankers**

***Surat Ammonia Supply Company***

105, Regent Towers, Race Course Circle, Baroda 390 007.
**Phones: 323827, 321897 & 320676** * Gram: SASCO * **Telex: 0175-497 SASC-IN**

**Ahmedabad Office:** M.H. ENTERPRISES, Plot No. 2018, GIDC, Vatva Phase II, Ahmedabad.
**Tel. No. Office: 336279, 348873**

**Ankleshwar Office:** J-3435, G.I.D.C. Estate, Ankleshwar-393 002, Gujarat State. **Phone: 2449.**

**Hyderabad Office:** SUPERCHEM AGENCIES, Godown No. 1, Behind Bakelite Hylam, Industrial Estate,
Sanathnagar, Hyderabad-500 018. **Telephone No. 263812.**

**Poona Office:** POONA GAS & CHEMICAL CO., Ratnakar, 8/16, Karve Road, Poona-411 004.
**Phones: 431110, 420330, 421695.**

**Vapi Office:** Shed No. 19, C-1, B. Type, Vapi Industrial Estate, G.I.D.C., Vapi-396 195. **Phone: 685.**

***BOMBAY AMMONIA & CHEMICAL CO.,***

204, B-Wing, Neelam Centre, 2nd Floor, Hind Cycle Road, Behind Glaxo, Worli, Bombay 400 025.
**Phones: 4948652/4948659/4949544/4946686.**

**RSG Your Local Source of Quality Chemicals**

UB PETRO PRODUCTS LTD. : PROPYLENE GLYCOL MONO-DI & TRI
COAL INDIA LTD. (Dankuni Coal Complex) : CRESOLS/XYLENOLS
ALLIED AROMATICS LTD. : MALEIC ANHYDRIDE, FUMARIC ACID
CARBON & CHEMICALS INDIA LTD. : CARBON BLACK
BINDAL INDUSTRIES : HYDRATED LIME
POLYCHEM LTD. : POLYNOLS
RADIANT AGRO CHEM PVT. LTD. : OXALIC ACID
ADITYA BUILDERS : HYDROQUINONE
BASF : PALEGAL/SEDIPUR TF:2/PVP K-30
TETRAHYDROFURAN
PERIYAR CHEMICALS LTD. : FORMIC ACID
TAN INDIA LTD. : SORBITOL
STAR CHEMICALS (BOM) PVT. LTD. : PHOSPHORIC ACID
STANDARD ALKALI : CAUSTIC SODA LYE/FLAKES/CAUSTIC POTASH/LIQUID CHLORINE/ POTASSIUM CARBONATE/HYDROCHLORIC ACID
TAMIL NADU CHEMICAL PRODUCTS LTD. : SODIUM HYDRO SULPHITE
TRAVANCORE TITANIUM PRODUCTS LTD. : TITANIUM DIOXIDE
NEYVELI LIGNITE CORPN. LTD. : PHENOL/ORTHO CRESOL/XYLENOL/LECO/ MULTIVALENT PHENOL/METAPARA CRESOL
ASIAN PEROXIDES LTD. HYDROGEN PEROXIDE

For more information or to order please contact:

**M/s. RAMNIKLAL S. GOSALIA**

17/21, Issaji Street, 308-310, Parshva Chambers, Vadgadi, Bombay 400 003.
Tel: 327314/24/03 * Tlx: 011-76882 RSG IN * Gram: NEW LUCKY

IMPORTED RAW MATERIALS AVAILABLE
WITH **MODVAT & DUTY DRAW BACK** BENEFITS

**PHARMACEUTICALS, COSMETICS FOODS**

- * PROPYLENE GLYCOL U.S.P.
- * AEROSIL - 200 N.F.
- * P.V.P. K-25/30/90 U.S.P.
  (PLASDONE/KOLLIDONE/POVIDONE)
- * ETHYL CELLULOSE N.F.
  N-7, 10, 20/22, 45/50, 200
- * METHYL CELLULOSE N.F.
  Grades: CULMINAL-MC 400, 4000 CPS
- * HYDROXY ETHYL CELLULOSE
  Grades: NATROSOL 250 LR/GR/MR/HBR
- * HYDROXY PROPYL CELLULOSE N.F.
  Grades: KLUCEL EF/LF/GF/HF
- * HYDROXY PROPYL METHYL CELLULOSE
  U.S.P.-2910
  METHOCEL/PHARMACOAT/METOLOSE
  METHOCEL E3/E5/E15/E50, E-4M, F-4M
  METHOCEL K-100, K-4M, K-15M
  PHARMACOAT 603, 606, 615
- * MICROCRYSTALINE CELLULOSE U.S.P./N.F.
  AVICEL PH 101/PH 102/RC-581/RC-591
- * CROSSLINKED NaCMC, U.S.P.
  AC-DI-SOL (TABLET DISINTEGRANT)
- * SODIUM STARCH GLYCOLATE U.S.P.
- * CROSPOVIDONE U.S.P. (DISINTEGRANT)
  KOLLIDONE CL/POLYPLASDONE XL
- * SODIUM CARBOXY METHYL CELLULOSE
  (FOOD/DENTAL/U.S.P. GRADES)
- * TITANIUM DIOXIDE U.S.P. (SUPERWHITE)
  ANATASE GRADE - BACTERIA CONTROLLE
- * CARBOMER/CARBOPOL 934, 940
- * VEE GUM/VEE GUM HV
- * XANTHAN GUM
- * PARA CHLORO META CRESOL B.P.
  (PREVENTOL CMK - CHLOROCRESOL)
- * P.E.G. 400/4000/6000/8000
- * POLYPROPYLENE GLYCOL (P.P.G.)
- * EUDRAGIT (ALL GRADES)
- * DL-LACTIC ACID, 88-92%, U.S.P.
- * POLYSORBATE (TWEEN 80) U.S.P.
- * VANILLIN/ETHYL VANILLIN
- * N-METHYL-2-PYRROLIDONE (NMP)
- * TERTIARY BUTYL HYDROQUINONE
  (ANTIOXIDANT - T.B.H.Q.)
- * OPADRY
- * CELLULOSE ACETATE PHTHALATE U.S.P.
- * HYDROXY PROPYL METHYL CELLULOSE
  PHTHALATE U.S.P.
- * POLYVINYL ACETATE PHTHALATE U.S.P.

**BULK DRUGS INTERMEDIATES**

- * TETRAHYDROFURAN
- * TERTIARY BUTYL AMINE
- * N-PROPANOL PURE (Undenatured)
- * HYDROXYLAMINE HYDROCHLORIDE
- * ADIPIC ACID
- * BENZALDEHYDE

PLEASE CORRESPOND WITH MR. MUKESH KAMDAR / MR. HARISH SHAH
AT

**CROWN CHEMICAL PRODUCTS**

**AT OUR NEW OFFICE ADDRESS**

305-B, NEELAM CENTRE, HIND CYCLE ROAD, WORLI, BOMBAY - 400 025
TELEPHONE: OFFICE: 493 7725 RESI: 409 3892 TELEX : 011-73926 CRWN IN
493 7726 407 5245 TELEFAX: 2040390
493 7727 646 3287
493 4141

India's Multinational and Leading Consumers prefer only KGI's Gum
The top quality products
For Your Regular Requirements of

**Gum Accacia**
(Powder & Crystal)

**Guar Gum**
(Pharma & All Other Grades)

**Gum Tragacanth**
(BPC Standard)

**Gum Arabic * Clove Oil**

WE CAN SUPPLY AS PER NEW I.P. 1985
WITH MICROBIOLOGICAL TEST

Please Contact:

**KAPADIA GUMCHEM INDUSTRIES**
G P O Box No 1160, 3 Mint Road, 2nd Floor, Opp G P O , BOMBAY 400 001
Phones: 2611087/2615073/2617217 Resl.: 6205517/6207028 Gram: PHARMAGUM
Fax No.: 91-22-2612659 Attn.: Mr. RAMESH KAPADIA

Together We Progress

**The most reliable name in Chemicals**
**DIAMINES**

International quality

Indigenously available

AMINO ETHYL
PIPERAZINE (AEP)

- Epoxy Curing Agents
- Corrosion Inhibitors
- Asphalt Additives
- Emulsifiers
- Pharmaceuticals
- Surfactants

For
Rubber and
other Polymers,
Lubricating
and Fuel Additives,
Electroplating,
Mining and Metal Recovery,
Coating and Adhesives,
Surfactants and Softeners.

TETRA ETHYLENEPENTAMINE
(TEPA)

PIPERAZINE (PIP)
ANHYDROUS

Intermediate for
Pharmaceuticals,
Rubber Accelerators,
Corrosion Inhibitors
and
Surface Active Agents

From the only manufacturers in India

**DIAMINES AND CHEMICALS LIMITED**
International Quality with Indigenous Ingenuity.

**Ahmedabad (H.O) :** 1, National Chambers, Ashram Road
Ahmedabad - 380 009 Phone 409626 Gram : DIAMINES
**Baroda (Works) :** Plot No 13, P O Petrofils - 391 347, Dist Baroda
Phone 3305 406 Gram DIAMINES Telex 0175 [illegible] DACJIN
**Bombay Office :** 85 C Wing Mittal Towers 8th Floor Nariman Po
Bombay 400 021 Phone 202950[illegible] Gram CELAGAR

Novnit/307/

**NOW AVAILABLE:**

**96% A.D. DODECYL BENZENE SULPHONATE**

**(HARD ACID SLURRY)**

**LINEAR ALKYL BENZENE SULPHONATE**

**(SOFT ACID SLURRY)**

**SULPHONATED WITH SULPHUR TRIOXIDE**

TRADE MARK

**MANUFACTURERS:**

**Arochem Silvassa Ltd.,**

Industrial Estate, Silvassa 396 230 -- Via Vapi,
Dadra & Nagar Haveli.
**Phone: 2889, 2691 Gram: AROCHEM SILVASSA**
**Telex: 0185 201 ARCM IN Fax: 02639-2291**

**BOMBAY** : Scent House, Station Road, Goregaon (West), Bombay 400 062.
**Phone: 6722280, Gram: AROSILVASSA,**
**Telex: 011-70038 FAIS IN, Fax: 022-672 0818.**
**KANPUR** : Chemdet Enterprises, Shop 67, 75/232, Sabji Mandi, Kanpur.
**Gram: SCENTOUS, Telephone: 64551.**
**MADRAS** : Syndet Enterprises, 90, Govindappa Naick Street, Madras 600 001.
**Gram: SCENTOUS, Telephone: 569032.**
**DELHI** : B. Shantilal & Co., 1025/5, First Floor, Gali Teliyan, Tilak Bazar, Delhi 110 006.
**Gram: INDOSIL, Telephone: 291 3973.**

*AVAILABLE REGULARLY*

***SPRAY DRIED 40%***
***A.D. ANIONIC DETERGENT***
***POWDER NEUTRAL-pH: 7-7.5***

**In Snow White Colour & Free Flowing**

**Bulk Density below 0.3**

Manufacturers

**Silvassa Syndet Private Limited**

Amli Industrial Estate,
SILVASSA 396 230 -- Via, Vapi,
Dadra & Nagar Haveli.
**Phone: 2685**

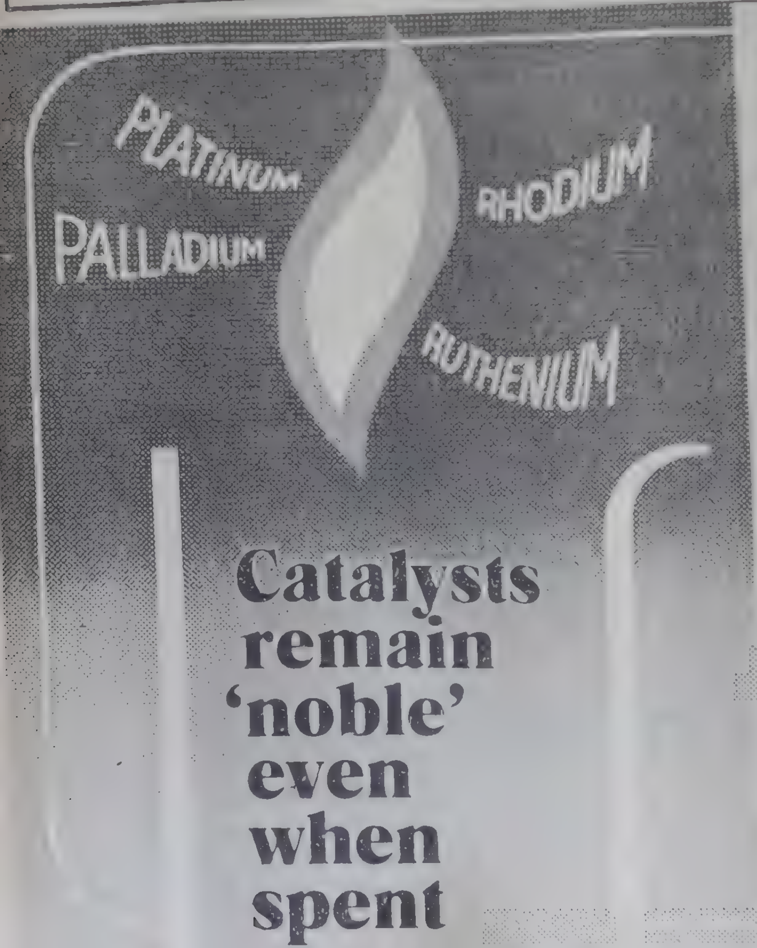
For most competitive quotation, best quality, prompt delivery of

CLOVE OIL (Pharma Grade)
CINNAMON OIL (Pharma Grade)
ANETHI OIL (Pharma Grade)
CASSIA OIL (Pharma Grade)
AJOWAN OIL (Pharma Grade)
ORANGE OIL (Pharma Grade)
CINNAMON LEAF OIL (Pharma Grade)
ALMOND OIL (Pharma Grade)
LEMON OIL (Pharma Grade)

Please Contact Manufacturers:

CHEMICAL PROCESS CONSULTANTS

Unit 202, Ádarsh Ind. Estate, Sahar Road, Chakala, Andheri (East), BOMBAY 400 099.
Gram: KEMIPROSS
Tel: 6325855



**Catalysts remain 'noble' even when spent**

**And when it comes to recovery there's none quite like us.**

We undertake recovery of noble metals from customer's spent catalysts and return them in the form of fresh activated catalysts like 1%, 3%, 5% or 10% Platinum or Palladium on carriers like activated charcoal, bariur sulphate or calcium carbonate or convert ther into metals or salts like PALLADIUM CHLORIDE, RHODIUM TRICHLORIDE TRIHYDRATE, CHLORO-PLATINIC ACID, PLATINU OXIDE (ADAM'S CATALY

We also manufacture salts of Silver, Gold and Platinum group metals

For further details contact:

parekh platinum pvt. lt

- 16B, Samhita Ind. Estate,
  Off Andheri Kurla Road.
  Bombay 400 072 INDIA.

- Cable: GOLDMARKET
- Phones: 320675, 344274
  5126801, 51247
- Telex: 011-72104 PTRH

AVAILABLE REGULARLY

SULPHAMETHOXAZOLE
PARACETAMOL
OXYPHENBUTAZONE
IBUPROFEN
TRIMETHOPRIM
AMPICILLIN TRIHYDRATE
ANALGIN

Please Contact

BAJAJ

BAJAJ ORGANICS (P) LTD.

102, 'YOGESHWAR' 135/139, KAZI SAYED STREET, BOMBAY 400 003.
**Telex: 11-75969 BJAJ-IN Gram: CAUSTICLYE**
**Phone: 348406/335133/333171 Resi: 653581**

*Branch Offices:*

Arunodaya Apartments, 1st Floor, Room No. J,
7-1-70, Dharam Karan Road, Ameerpet,
HYDERABAD 500 016.
**Telex: 425-2163 BJAJ IN**
**Gram: CAUSTICLYE**
**Phone: 228004/36472**

89, Chandan Society,
Opp. Yashoda Nagar Tekro,
Ahmedabad-Bombay Highway,
Yashoda Nagar,
Ahmedabad 382445.
**Phone: 834546**

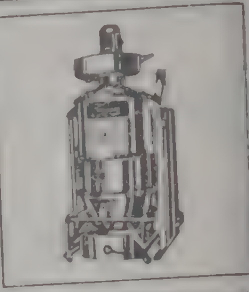
YOUR SEARCH FOR QUALITY PRODUCTS END AT
RICHARD ENGINEERING WORKS

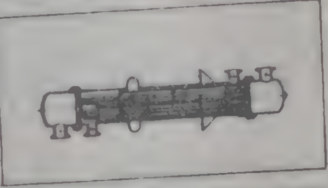
WHICH IS SERVING THE CHEMICAL INDUSTRY ALL OVER INDIA AND ABROAD FOR THE LAST 25 YEARS WE ARE KNOWN FOR QUALITY AND MAINTENANCE FREE EQUIPMENTS

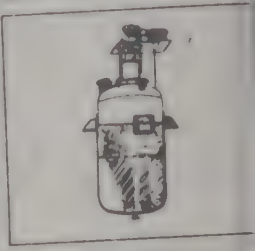
MANUFACTURERS OF:
☐ FLUID BED DRYER ☐ TRAY DRYER ☐ DRUM DRYER ☐ FLAKER ☐ CENTRIFUGE ☐ LEAF FILTER ☐ PRESSURE FILTER ☐ PRESSURE VESSEL ☐ OPEN REACTION VESSEL ☐ REACTION KETTLE ☐ AUTO—CLAVE ☐ EVAPORATOR ☐ HEAT EXCHANGER ☐ DISTILLATION COLUMN ☐ CRYSTALISER ☐ BALL MILL ☐ BLENDER ☐ GRANULATOR ☐ STORAGE TANK (M.S., S.S., F.R.P., RUBBER LINED ALUMINIUM AND LEAD BONDING) ☐ HYDRO GENERATOR & OTHER CHEMICAL EQUIPMENTS

WE UNDERTAKE PROJECTS ON TURN-KEY BASIS

CONTACT: RICHARD ENGINEERING WORKS
M.I.D.C. CHEMICAL ZONE, AMBARNATH-421 501. PHONE: 2513





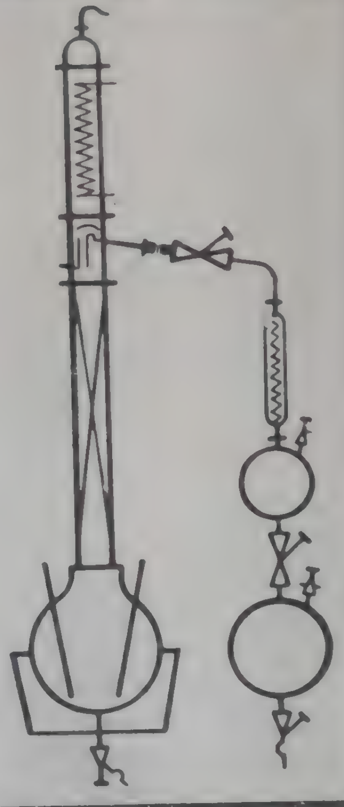


EXTRA STRONG
PROCESS GLASS EQUIPMENT
goel introduces XTRONG range

OUR PRODUCTS : BOROSILICATE Glass Vessels, Pipe sections, Reducers, Tees, Bends, Valves, Column, Sections, Reflux Dividers, Heat Exchangers, Stirrers, Sight Glasses, Couplings and Teflon items and their installation.

OUR SPECIALITIES :
High Vacuum Reaction & Distillation Units
HCl Absorbption/Generation/Distillation Units,
Pipe Line/Column Components of 9" & 12" Dia.
Liquid/Liquid & Solid/Liquid Extraction Units.

goel scientific works pvt. ltd.
D/35, Sardar Estate, BARODA-390 019.
Ph. : 541692 Tlx. : 0175 565 GOEL IN



*Manali Petrochemical Ltd.*

with Technical Know-how of

*ARCO* (U.S.A.)

have pleasure to announce the commencement of production of the following products:

**PROPYLENE GLYCOL IP/TECH**
**DI PROPYLENE GLYCOL**
**TRI PROPYLENE GLYCOL**
**DI CHLOROPROPANE**
**(PROPYLENE-DI-CHLORIDE)**
**PROPYLENE OXIDE**

Please Contact our

CONSIGNMENT STOCKIST & INDENTING AGENTS
(for Maharashtra, Goa, Dadra, Nagar Haveli, Daman & Diu)

***M/s. Jupiter Dyechem Pvt. Ltd.***

64-B, Wing, Mittal Court, 6th Floor, Nariman Point, Bombay 400 021.
**Tel. No.: 2048975/224880/2860141/2863604 Telex: 011-83730 RKC IN Gram: JUDGEMENT**

FOR YOUR REQUIREMENTS OF:

**MANALI PETROCHEMICAL LIMITED : PROPYLENE GLYCOL — IP/Tech, DIPROPYLENE GLYCOL, TRI PROPYLENE GLYCOL, DICHLOROPANE, (PROPYLENE-DICHLORIDE), PROPYLENE OXIDE.**
**SPIC LTD. (*HEAVY CHEMICAL DIVISION*) : CAUSTIC SODA FLAKES/LYE, CHLORINE, AMMONIUM CHLORIDE — Tech. Grade**
**OSWALI CHEMICALS LTD. : BETA NAPHTHOL**
**BIDDLE INTERMEDIATES PVT. LTD. : DASDA / NASDA / MPDSA, H-ACID / K-ACID**
**GRASIM INDUSTRIES LTD. : ANHYDROUS SODIUM SULPHATE — 98-99%**
**CENTURY RAYON : ANHYDROUS SODIUM SULPHATE — 98-99%, SULPHURIC ACID, CAUSTIC SODA LYE**
**KOLHAPUR SUGAR MILLS LTD. : ACETIC ACID, BUTANOL.**
**SANGLI SSK LTD. : ACETIC ANHYDRIDE**
**SOUTHERN HALOCHEM PVT. LTD. : CHLORINATED PARAFFIN**

Please Contact:

RAMESH KUMAR AND COMPANY

ILACO HOUSE, 1ST FLOOR, SIR P.M. ROAD, BOMBAY 400 001
Gram: JUDGEMENT Telex: 11-83730-RKC IN Telephone: 2860141, 2863604, 253609

ATTENTION ► END USERS, EXPORTERS

YOUR SEARCH FOR THE BEST QUALITY OXALIC ACID ENDS HERE!

OVER 99% PURITY

Paschim Chemicals Pvt. Ltd.

**Admn Office:**
402, Chartered House. 293/299
Dr. Cawasji Hormasji Street,
Marine Lines Bombay-400 002.
Tel 253421, 297158.

**Regd. Off:**
524, Cotton Exchange
Kalbadevi Road
Bombay 400 002
Tel: 314637

EVERY COLOUR UNDER THE SUN

...TO BRIGHTEN U
YOUR FABRICS

We manufacture Napthols Intermediates under quality control through our R & D Department

1. NAPTHOL AS
2. NAPTHOL ASBS
3. NAPTHOL ASBO
4. NAPTHOL ASOL
5. NAPTHOL ASTR
6. NAPTHOL ASD
7. NAPTHOL ASG
8. NAPTHOL ASSW
9. NAPTHOL ASE
10. PARA NITRO ANILINE (PN
11. ORTHO NITRO ANILINE (ONA)
12. ORTHO PHENYLENE DI-AMINE (OPDA)

AND MANY OTHERS...

MANISH

**Manish** PRODUCTS

Office: 15-A, Haresh Chambers, 3rd Floor,
313-319 Samuel St., Vadgadi, Bombay-400 003, In
Phones Off 327629, 349605
Resi 6490400, 6494762 Gram: "TAWATA"
Factory: A/80, M.I.D.C. Phase I, Dombivali (East

Manish

DYES IN A WIDE VARIETY

**The Planet Earth is the greatest chemist we know.**

What fecund and creative chemistry.
Every human, plant, animal, rock, gas or liquid
on earth has a simple or complex chemistry
behind it. The idea of so much thought and
unconscious formulation seems mind-boggling,
but Nature does it regularly and effortlessly.
It inspires us.

Process chemicals for the textile industry for Sizing, Desizing,
Mercerising, Scouring, Dyeing, Printing and Finishing.

SUPERTEX®

SUPERTEX®
(INDIA) CORPORATION
132, Dr. Annie Besant Road, Bombay-400 018
Phone: 493 6041, 493 38 18, 493 5482.
Grams: 'Thinogum'. Telex: 75643.

a M.G. Saraf Enterprise
Most trusted name in chemicals.

YOUR PACKING PROBLEM IS NOW SOLVED.

Because Reliance Jerrycans & Barrels are manufactured on most sophisticated automatic Blow-moulding Machines with rigid quality control and passing through all kinds of different tests assure you the best guaranteed protection to your precious products.

**Reliance**

JERRYCANS & BARRELS

Manufactured by:

**RELIANCE PLASTICS**

11-A, Unique Industrial Estate,
Opp Jawahar Talkies, Mulund (West),
Bombay - 400 080.
Phone: 5619994, 5618131 Res: 5613186

*from quality toppers*

*AVAILABLE IN BULK QUANTITY, BEST QUALITY MATERIAL AGAINST MODVAT FACILITY*

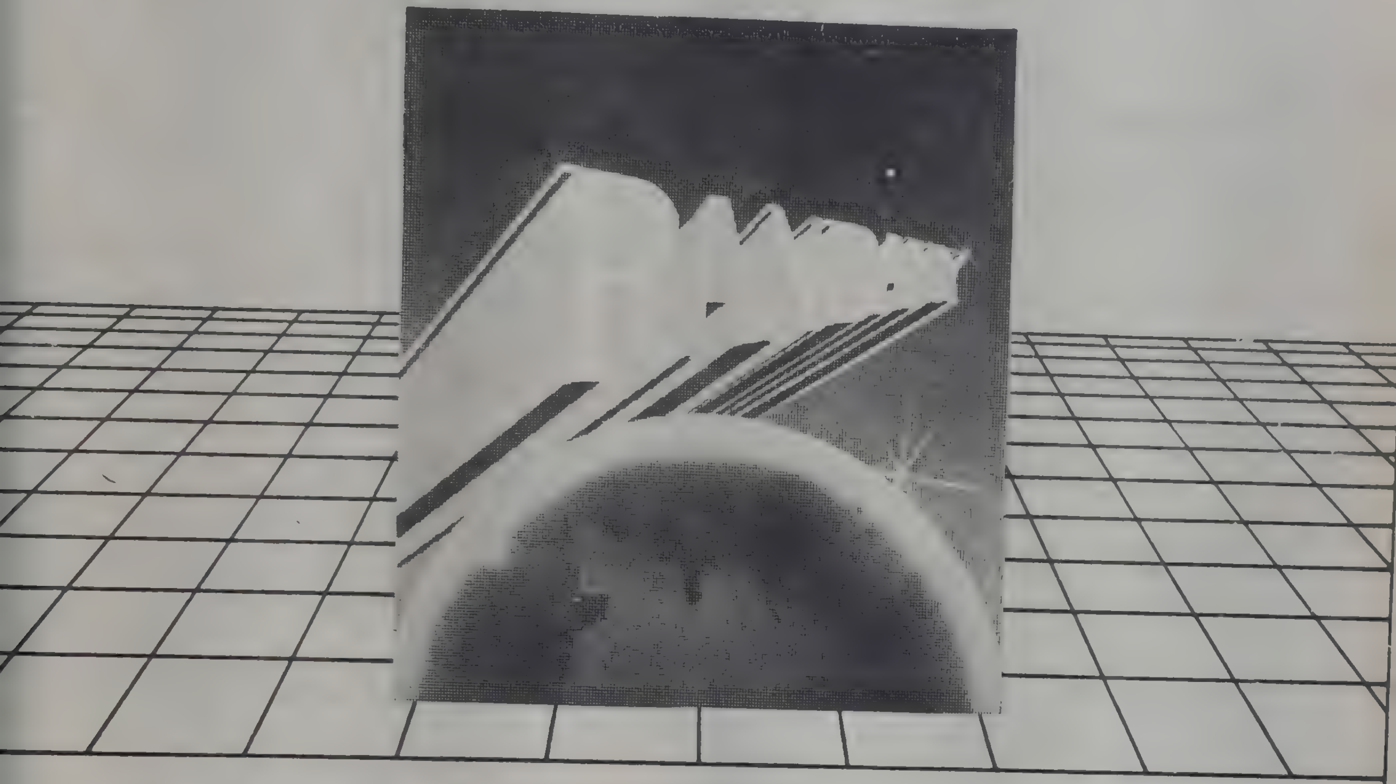
1. **FATTY ACIDS:** Oleic, Recenoleic, and other Fatty Acids.
2. **METALLIC STEARATES & PVC STABILISERS:**
   - a) ***SOLID:*** TBLS, DBLS, DBLP, L.S., C.S., Lead Complex Stabiliser LI 615 & 612 for Rigid PVC Pipes & Cables.
   - b) ***LIQUID:*** Barium Cadmium Liquid Stabiliser & Chelators.
3. **ORGANO TIN STABILISERS:** Toxic, Non-Toxic
4. **RUBBER CHEMICALS:** Zincomat, Thiuram (TMT), S.P., Z.D.E.C., Mentafor-F, Stickex, Rubber Foam Stabiliser.

CONTACT MANUFACTURERS

**M/s. M.G. CHEMICALS AND OXIDES**

G-42, 'D' Wing. Dewan Apts. No. 2, Navghar, Vasai Road (East), Dist. THANA, Pin: 401 202
**Phone: (02523) 3118 / (02523) 3117**
**OUR BOMBAY OFFICE ADDRESS:**
A-10/3, Indrayudha Hsg. Society, M.G. Road, Goregaon (W), Bombay 400 090. **Phone: C/o. 6722018**

# Ranbaxy's High-Tech Bulk Drugs
## Tested to international standards



**No. 1 in exports.**

Ranbaxy has achieved the singular distinction of emerging as the largest exporter of bulk drugs from India — A tribute to its quality standards which have been accepted the world-over.

**A comprehensive range:**

Ranbaxy's bulk drugs include the following products:

1. **Ampicillin Trihydrate IP/BP/USP. (Compacted/Syrup/micronised)**
2. **Amoxycillin Trihydrate IP/BP/USP (Compacted/Syrup)**
3. **Cephalexin Monohydrate IP/BP/USP (Compacted/Syrup)**
4. **Chloroquine Phospate IP**
5. **Cloxacillin Sodium IP/BP**
6. **Doxycycline Hydrochloride IP/BP/USP**
7. **Nalidixic Acid IP**
8. **Norfloxacin**
9. **Ranitidine Hydrochloride**

**For your requirements, please contact:**

**RANBAXY**
**LABORATORIES LIMITED**

Chemical Division Marketing Office
16, Marina Arcade, Connaught Circus
New Delhi-110001
Phones : 3323738, 3323739
Telex : 031-63487
Cable : RANBAXYLAB
CONNAUGHT CIRCUS, NEW DELHI

Rated best by every test!

## RUKMA-CHEM
## Offers

## NONIONICS

**BASED ON NONYL PHENOL OCTYL PHENOL, CASTOR OIL, FATTY AMINES ETC.**

POLYSORBATES 20, 60, 80,
EMULSIFYING WAX
CETOMAGRAGOL 1000

| | | | |
|---|---|---|---|
| P.E.G. | 200 | P.E.G. | 1450 |
| P.E.G. | 300 | P.E.G. | 3000 |
| P.E.G. | 400 | P.E.G. | 4000 |
| P.E.G. | 600 | P.E.G. | 6000 |
| P.E.G. | 1000 | P.E.G. | 8000 |

EMULSIFIERS : DEMULSIFIERS
ANTISTATIC OIL : CONING OIL ETC.

**CALCIUM SALT IN BUTANOL**
**70% ACTIVE**

*Contact Manufacturers*

Rukma

**Rukma-Chem Products P. Ltd.**

**Office:** SM Bhavan, Plot No. B-7 & B-10,
Road No. 8 & 15, Wagle Industrial Estate,
Thane 400 604. Maharashtra.
**Tel. No.:** 509383/594144/594145
**Telex:** 011-79380 SMIM IN **Fax:** 31-22-6344985
**Works:** W-89(D), M.I.D.C., Chemical Zone,
Taloja, Panvel, Dist. Raigad.
**Phone:** 410 TALOJA

## MANUFACTURERS OF ACID MILLING DYES

RED RS * RED G * RED GRS * RED 3BN *
PINK R * RED F2R * MAROON V *
NAVYBLUE S5R * YELLOW 5GN *
YELLOW M * YELLOW N4GN *
GOLDEN YELLOW N2M *
METAL COMPLEX BLACK WA &
DIRECT DYES

chromill colour industries

**CHROMILL COLOUR INDUSTRIES**

## INTERMEDIATES for DYES Manufacturers

2:5 DICHLORO 1:4 SULFOPHENYL -
3 METHYL 5 PYRAZOLONE *
1 4 SULFOPHENYL 3 METHYL 5 PYROZOLONE *
G-SALT * EBA METASULFONIC ACID. *
PARA AMINO AZO BEZENE SULPHONIC ACID *

**SHIDIMO INTERAUX PVT. LTD.**

Office: 901-902, Adatia Awas, Bombay Market,
Umarwada, SURAT 395 010.
Gram: CHROMILL
Phone: 44438, 43758

Factory: S.No.: 245, LAJPORE. 394 235
Via Sachin Dist. Surat.
Phone: 60, 61.

Export Inquiries Solicited.

# BASF your partner for progress

*Offers*

Organic Intermediates, Inorganic Chemicals, Solvents, Plasticizers, Fine Chemicals, Vitamins, Catalysts, Nyloprint® - Photo Polymer Plates etc., for the following industries:

| | |
|---|---|
| CHEMICALS PROCESSING | PERFUMERY |
| COSMETICS | PESTICIDES |
| DRUGS & PHARMACEUTICALS | PRINTING |
| DYESTUFFS | RUBBER CHEMICALS |
| ELECTRONICS | THERMOPLASTIC POLYURETHANE |
| FEED (ANIMAL NUTRITION) | WATER TREATMENT |

AND MANY MORE

For further details and imports against OGL/valid import licences

**Please Contact:**

**BASF India Limited**
Maybaker House.
Sudam Kalu Ahire Marg.
P.O. Box 19108
Bombay-400 025
Phone: 493 0703
Grams Basfindia
Telex: 1171538 BASF IN

**Branch Offices:**

Karaka Bldg No 1, Ashram Road
Nawrangpura, Ahmedabad-380 009
Tel 407074
Telex 121-237 BASF IN

Garuda Bldg 46, Cathedral Road,
Madras-600 086
Tel 473561/3563/5956/7606
Telex: 41-7822 BASF IN

13 A, Government Place, East,
Calcutta-700 069
Tel.: 233898/3928/5869/3883
Telex 21-7044 BASF IN

7, Basant Lok Vasant Vihar
New Delhi-110 007
Tel 3313118/3119/3110
Telex 31-62063 BASF IN

BASF

FOR YOUR REQUIREMENTS OF:

TRICHLOROETHYLENE
PERCHLOROETHYLENE
AND
TETRACHLOROETHANE

Contact

For North India:
**M/s. B.S. MEHRASONS PVT. LTD.**
B-1/14, Ashok Vihar Phase II, Delhi 110 052

Phones: 741742/7118800/2512975/2916979
Telex: 031-78005 PEC IN

For Maharashtra & Goa:
**M/s. PHARMA CHEMICALS**
302, Karsan Natha Trust Building,
330, Samuel Street, Vadgadi, Bombay 400 003.
Phones: 344115/342689/337417
Telex: 011-73635 BSM IN

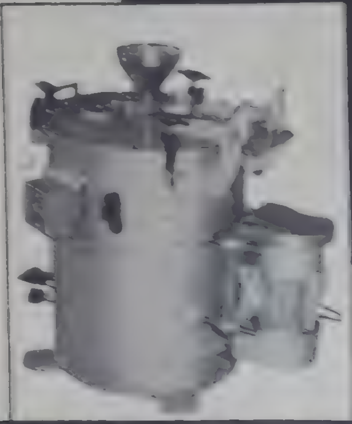
Consignee Agents & Stockists of:

**M/s. THE METTUR CHEMICAL & INDUSTRIAL CORP. LT**

NOW CHEMICALS AND PLASTICS INDIA LTD.

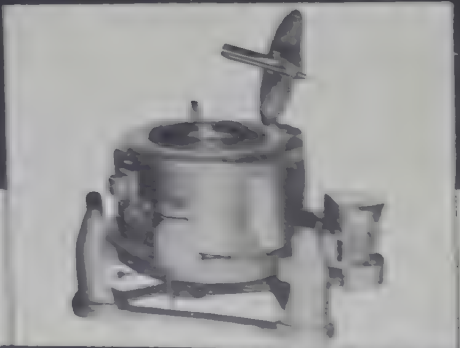
Other Products: C.T.C. • CHLOROFORM • METHYLENE CHLORIDE • ETHYL SILICAT
FUMED SILICA • AROMATIC CHEMICALS

A LEADING NAME IN
CENTRIFUGES



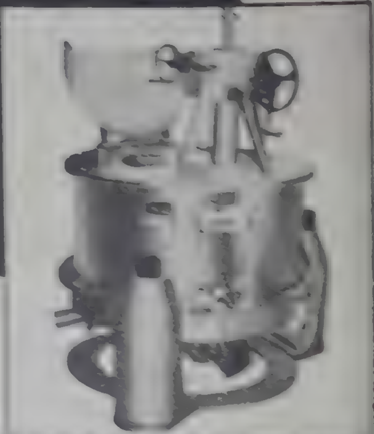
LABORATORY

[illegible]



TOP DISCHARGE

[illegible]



VERTICAL PLOUGHING

[illegible]

PEW
PARISHRAM

PARISHRAM ENGINEERING WORKS
Regd. Office: 115, Mittal Co-operative Industrial Estate, Mathuradas Vasanji Road
Near Sakinaka, Bombay-400 059. Phones: 6344787 □ Residence: 5124380
Telex: 011-79290 DPEW IN Gram: DENPARIKH.

# If the history of planet Earth can be seen as 1 day, then,

1) The Human species arrived only 10 minutes ago.
2) Civilization is only 5 seconds old.
3) The Industrial Revolution only 1/8th of a second.
Yet so much has been achieved in 1/8th of a second.

Superchem making the most of 1/7th of 1/8th since we arrived 'only' 30 - years ago

Process chemicals for the textile industry for Sizing, Desizing,
Scouring, Mercerising, Dyeing, Printing and Finishing.

**SUPERCHEM®**
32, Dr. Annie Besant Road, Bombay-400 018
Phone: 493 6041, 493 38 18, 493 5482
Grams: 'Thinogum' Telex 75643

a M.G. Saraf Enterprise
Most trusted name in chemicals.

Available From Ready Stock:

IN SMALL PACKINGS OF 450 ML / 5 Lit / 30/35 Lit & 50 Lit/Kg.

Acetone
Amyl Acetate
Acetic Acid Glacial
Aniline Oil
Butyl Alcohol - N
Butyl Acetate
Benzene (N.G.)
Carbitol
Carbon Tetra Chloride
Chloroform/Cellosolve
Cellosolve Acetate
Cyclohexanone
Cyclohexylamine/D.E.P.
Di Acetone Alcohol
Di Butyl Phthalate

Di Octyl Phthalate
Di Ethanolamine
Di Ethylene Glycol
Di Methyl Formamide
Epichlorohydrine
Ether Petroleum (40/60)
Ether Petroleum (60/80)
Ether Petroleum (80/100)
Ether Petroleum (100/120)
Ethyl Acetate
Ethylene Glycol
Ethylene Dichloride
Formaldehyde 37%
Glycerine iso Propanol
Hydrazine Hydrate

Liquid Paraffin Light
Liquid Paraffin Heavy
Methyl Ethyl Ketone
Methyl Iso Butyl Ketone
Methylene Chloride
Mono Chloro Benzene
Mono Ethanolamine
Mineral Turpentine
N. Hexane/Octoic Acid
Octyl Alcohol/O.D.C.B.
Oleic Acid Commercial
Oleic Acid Pure
Pine Oil
Perchloro Ethylene
Propylene Glycol

Phosphoric Acid
Poly Glycol 200/400/600/800
Potas Hydroxide Pellet
Silicone Oil (All Grades)
Silicone Grease
Sodium Silicate Natural
Solvent Naphtha Heavy
Solvent Naphtha Light
Sorbitol/Styrene Monomer
Tertiary Butanol
Trichloroethylene
Toluene (N.G.)
Tri Ethanolamine
Trichloro Benzene
o-Xylene

Please Contact:

**MEMBA CHEM CORPORATION**

19, M.J. Co-op. Housing Society Ltd., Ground Floor, 187, Shamaldas Gandhi Marg (Princess Street), Bombay 400 002.
Phone: 316261/252255

---

FOR YOUR REQUIREMENT OF 'NECOL' BRAND

**FOOD COLOURS (ISI)**

TARTRAZINE
CARMOISINE
SUNSET YELLOW FCF

BRILIANT BLUE FCF
BRILLIANTBLUE FCF SPECIAL SUPRA
FAST GREEN FCF - Developed First Time in India

INRODUCING VERY SHORTLY

AMARANTH
ERYTHROSINE

INDIGO CARMINE
PONCEAU 4R

ALSO AVAILABLE

Quinoline Yellow (Water Soluble & Spirit Soluble), Alizarine Cyanine Green F & Naphthol Blue Black

FOOD COLOUR MIXTURE

Such as Brown, Black, Green, Keshar, Falsa etc.

NECOL

Please Contact:

**NEELICON DYESTUFFS**

*Office:* National Insurance Building,
204, Dr. D.N. Road, BOMBAY - 400 001
**Tele: 2045322**

*Factory.* Plot No. 67, M.I.D.C. Indl. Area,
DHATAV 402 116, Dist. Raigad.
**Tele: 2194**

---

**We are pleased to offer our own**

**TOLUENE**

**(Nitration and Pure Grade)**
**(in barrels or bulk)**

**To actual consumers having all valid licences.**

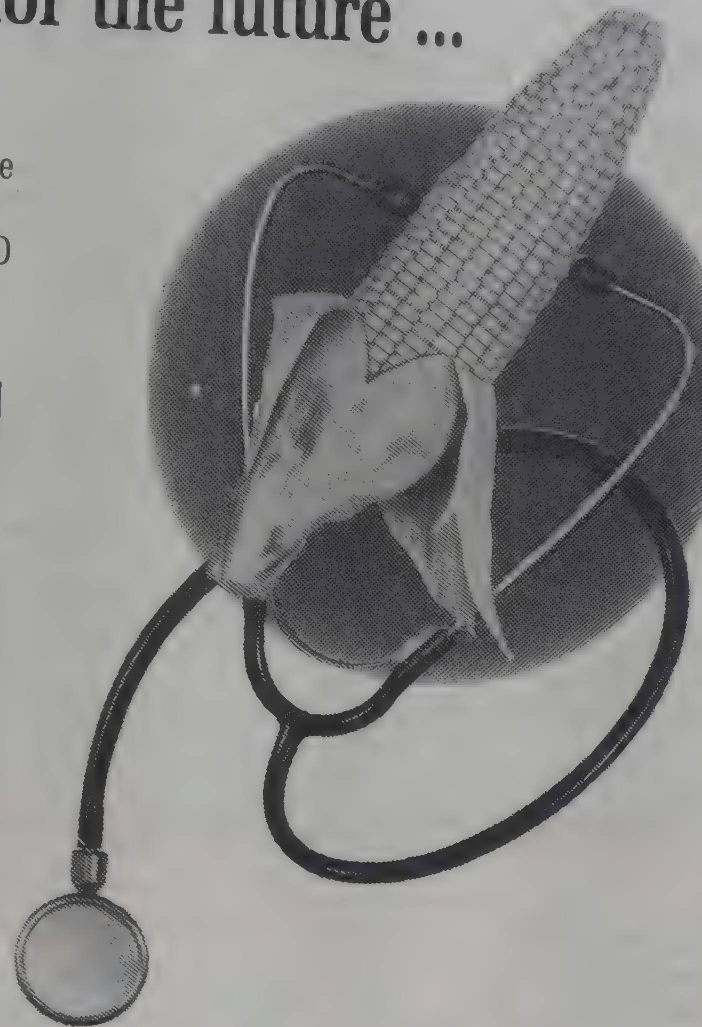
Kindly write with full details to:

**M/s. SAVIORAY LABORATORIES PVT. LTD.**

Post Box No. 5527,
Dadar, Bombay 400 014.

# Shaping health for the future ... from maize

K.G. Gluco Biols Ltd., a new star in the pharmaceutical, food and beverage industry backed by KSIIDC and GLAXO now offers a range of maize starch derivatives.



**Liquid Glucose:** Pharmaceuticals, confectionery, food and beverages, tobacco, leather.

**High Maltose Syrup:** Confectionery, food and beverages.

**Dextrose Monohydrate:** Canning, food and beverages, pharmaceuticals, animal feeds, adhesives, boiler compounds, acids, dyes, enzymes, explosives.

**Maltodextrin:** Baby foods, frozen foods, ice creams, dietetic foods, condiments, confectionery.

**Maize Gluten:** Aqua culture, animal feeds, adhesives.

**Corn Steep Liquor:** Pharmaceuticals.

In addition to the above, K.G. Gluco Biols offers by-products like maize fibre, hydrol, maize gum, maize oil and maize germ cake. Manufactured under extremely hygienic conditions at a modern plant at Gokak, Karnataka.

K.G. Gluco Biols Ltd. Soon you'll be hearing more about the company that's on the threshold of a great future.

*For product details, contact:*
The Commercial Manager
**K.G. GLUCO BIOLS LTD.**
P.B. No. 8044, No. 85, 9th Cross Road,
Rajmahalvilas Extension, Bangalore-560 080
Phones: 344634, 344658 Grams: GLUCO BIOLS

K.G. Gluco Biols – Our concern is your health.

***Consignee Agent:*** **Lalji Lakhamshi & Co.,** 15, Pathak Wadi, Lohar Chawl, Bombay 400 002. Ph: 297513/292278

CLARION-BL/KGGBL/9024

ATTENTION CONSUMERS AND EXPORTERS
AVAILABLE QUALITY PRODUCTS

**2:5 Di Chloro Aniline** (Scarlet GG Base)
**2:5 Di Chloro Nitro Benzene**
**Ortho Chloro Aniline**
**Para Nitro Phenol**
**Sodium Para Nitro Phenol**

Contact Manufacturers:

**GEMCHEM INDUSTRIES**
**MEDICS LABORATORIES**

74, Matru Smruti, Road No. 4, Scheme No. 6, Sion (East), Bombay 400 022.
Phones: 4077431/32/33 * Telex No.: 011-73254 ALAB IN

---

FOR YOUR REGULAR REQUIREMENTS OF:

**BON ACID**

(Manufactured By: NEWPAR AROMATICS P. LTD.)

Please Contact:

**P.D. SALES CORPORATION**

206/A, Matru-Chhaya, 378/80, Narshi Natha Street, Bombay 400 009.
Phone: Off.: 347430 Resi.: VIRESH MEHTA 5617576 PRADIP SHAH 5139539

WE ALSO OFFER

- 2:5 Dichloro Aniline (Fast Scarlet GG Base)
- Meta Chloro Aniline
- P.C.A.
- P.N.C.B.

---

Ethylene Dichloride 250 Kg. HDPE Drum Packing Formaldehyde 220 kg. HDPE Drum Packing
TRIETHANOLAMINE DIETHANOLAMINE MONOETHANOLAMINE
ETHER PETROLEUM 40-60/60-80/80-100/80-120/90-100/100-120 OLEIC ACID TECH

AMYL ACETATE
BUTYL CELLOSOLVE ACETATE
BUTYL CARBITOL ACETATE
CELLOSOLVE ACETATE
MONOCHLORO BENZENE
TRICHLORO BENZENE
PARA DICHLORO BENZENE

CARBITOL ACETATE
ISOPROPYL ACETATE
METHYL ACETATE
OCTYL ACETATE
ORTHO DICHLORO BENZENE
ISO AMYL ALCOHOL

TRIETHLAMINE
DIETHYLAMINE
MONOETHYLAMINE
MONOISOPROPYLAMINE
DIISOPROPYLAMINE
MONOCYCLOHEXYLAMINE
DICYCLOHEXYLAMINE

For INK / VARNISH / PAINTS Mfgs
MALEIC RESIN (Spirit Soluble / Oil Soluble)
POLY VINYL BUTYRAL (P.V.B.)

QUALITY CSC SOLVENTS

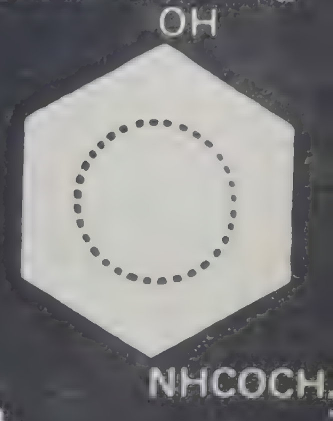
**Chemical Solvent Centre**
43, Princess Street, 3, Devkaran Mansion, 1st Floor, Bombay 400 002.
Office: 314293 * 313812 * 254853 Resi: 8114061 * 6301104
Gram: CHESOLVFCE * Telex: Asim 011-73145

PARACETAMOL
IP/BP

CHEMICAL Formula

Acetaminophen
4′ — Hydroxyacetanilide
P — acetylaminophenol
N — Acetyl p-aminophenol
P — acetaminophenol
P — acetamidophenol

STRUCTURAL Formula



MANUFACTURAL Formula

farmson

THE PERFECT PRODUCT OF

farmson
Pharmaceutical Gujarat Pvt. Ltd.

**Head Office:** Shankar Bhuvan, Sayaji Gunj, Vadodara-390 005. Phones: 327136/327138.
Grams: FARMSON. Telex: 0175-694 KEKE IN
**Works:** 98/1-2-3-4, GIDC Industrial Estate, Nandesari, Dist. Vadodara. Phone: 219.
**Research Centre:** At Nurpura, Post Baska, Tal. Halol, Dist. PANCHMAHALS.

**SALES OFFICES:**
**Bombay:** 404, Embassy Centre, Nariman Point, Bombay 400 021. Phones: 231144, 230383.
Gram: KEKEVII
**Hyderabad:** 1-1-700/B-1, New Bakaram, Hyderabad-500 380. Phone: 65836, Gram: FARMSON.

**Regional Representatives**
- KHOKANI ASSOCIATES, 3rd Floor, Keshav Baug, 116, Princess Street, BOMBAY-400 002. Tele. No. 252244, 252688.
- PAN ASIAN Commercial Corporation, 4, Rabindra Sarani, CALCUTTA-700 001. Tele. No. 277595-475047. Cable: PANASIAN.
- B & I Enterprise, Cama Building, 2nd Floor, 24/26, Dalal Street, BOMBAY-400 023. Tele. No. 271964.
- NEELGIRI AGENCY, B-5, Shivlok House-1, Karampura Comm. Centre, Opp. Milan Cinema, Najafgarh Road, NEW DELHI-110 015. Tele. No.: 5413818.

NIRMAL

The Biggest Manufacturer of India

FOR YOUR REQUIREMENTS OF:

- Vinyl Sulphone Dyes -- Turquoise Blue G
- Reactive Turquoise Blue H5G, H7G, H2G
- Reactive Navy Blue HR
- Direct Turquoise Blue

FOR EXPORT

CI BLUE -- 21
CI BLUE -- 25
CI BLUE -- 59
CI BLUE -- 86

Contact Manufacturers:

**AT BOMBAY OFFICE:**

**BLUESTONE DYE CHEM INDUSTRIES**

**Office:**
77/87, Abhechand Gandhi Marg,
Shreeji Krupa Building
Room No. 19, 2nd Floor, Bombay 400 003
**Phones: 342466/324526, C/o. 345512, Resi.: 5610860**

**Factory:**
Shed No. C-1/B-3, G.I.D.C., Vapi,
Dist. Bulsar, Gujarat, Pin 396 195.
**Phone: 837.**
**(Export enquiries also solicited)**

*Associated Concern* KUSUM DYE CHEM INDUSTRIES
Plot No. 303/8/D, G.I.D.C., Vapi District Bulsar, Gujarat Pin. 396 195.

FOR YOUR BULK REQUIREMENTS OF:

**Naphthol ASG**
**T.R.O. (Turkey Red Oil)**
**Sodium Lauryl Sulfate**
**Sodium Lauryl Ether Sulfate**
**Triethanolamine Lauryl Sulfate**
**TEBA (Phase Transfer Catalyst)**

Please Contact Manufacturers:

**SWAPNA CHEMIE**

25/160, D.N. Road, Fort, Bombay 400 001.
**Telephone: 2047713**

**OTHER PRODUCTS OFFERED: TRIACETIN, CABS, MOLINEX COMPUTERS AND MEDIA PRODUCTS**

For Your Regular Requirements of:

Acetonitrile
Acetyl chloride
Acrylamide * Acrylonitrile
Allyl Alcohol
Alpha Picoline
Butyl Cellosolve * B.H.T.
Chloroform * Cyclohexane
Di Methyl Formamide
Di Methyl Sulphoxide
Epichloro Hydrine
Ethylene Dichloride
Formic Acid -- 99% & 85%
Hydroxylamine Hydrochloride
Hydroxylamine Sulphate
Iso Amyl Alcohol
Iso Butyl Alcohol
Iso Butyric Acid
Iso Propyl Alcohol
Lithium Hydroxide
Magnesium Oxide
Malonic Acid
Methyl Cellulose 4000
Methyl Cellosolve
Methyl Formate
Morpholine
Methyl Ethyl Ketone
N. Butyl Amine * N. Butyric Acid
N. Heptane * N. Propyl Amine
Quinoline * P.C.B.A.
Para formaldehyde 84-85%
Perchloro Ethylene
Petroleum Ether 40-60%, 60-80%, 60-95%
Secondary Butanol
Sodium Methoxide
Soya Lecithin Powder
Thiourea
Tri-Chloro Ethylene, T.E.G.
Tertiary Butyl Alcohol
Xanthone * Zinc dust

**H.P.M.C. 5 CPS, 15CPS, 50CPS, 606 CPS**

Please Contact: **Gurukrupa Chemical Corporation**

Gopal House, 2nd Floor, 7/9, Kumbharwada Cross Lane, Veer Vithaldas Chandan Street, BOMBAY 400 003.
Phones: 321020/339968/344937
Residence: 6124644/6122149

*Connected to one of the oldest industries in the world, which incidentally is also the youngest.*

*From ancient garments made of bark and hide, through historical finds of Chinese silk and Egyptian cotton at burial sites, to modern fabrics made on computerized looms, humankind's relations with clothes are as old as civilization. From the time when lamp-black, powdered lapis lazuli, red ochre, dye secretions of the banded murex snail, indigo and other plant, mineral and animal dyes have been used, human facination with colouring agents is also well known.*
*We at Texchem continue this oddyssey, this quest for cloth and its colour.*

*Process chemicals for the textile industry for Sizing, Desizing, Scouring, Mercerising, Dyeing, Printing and Finishing.*

TEXCHEM®

TEXCHEM®

132, Dr. Annie Besant Road, Bombay-400 018
Phone: 493 6011, 493 38 18, 493 5482.
Grams: 'Thinogum', Telex: 75643.

a M.G. Saraf Enterprise
Most trusted name in chemicals.

AVAILABLE

* STEARIC ACID (All Grades)
* RICE BRAN DISTILLED FATTY ACID
* GLYCERINE (I.W.)

For Quality, Competitive Prices & Regular Supplies

Contact:

**FOODS FATS & FERTILISERS LTD.**
G.P.O. Box No. 10066, Green House, Green Street, Fort, Bombay 400 023.
Tele: 2862136/2861846

**25 Glorious Years!**

FOR YOUR REQIUREMENTS OF

| | |
|---|---|
| Ammonia Gas | PURITY 99.5% IN CYLINDERS OF 40 & 50 KGS ROAD TANKERS OF 5, 6, 7 M.T. |
| Ammonia liquor | SPECIFIC GRAVITY 0.910 & 0.888 IN ROAD TANKERS, 7-9 M.T. DRUMS, CARBOYS & BOTTLES |

Please Contact: **ASCO CHEMICAL COMPANY**

61, Bombay Talkies Compound, Post Box No. 17629, Malad (West), Bombay 400 064.
**Tel.: Off.: 6820151/6821667/692233; Resi.: 6265775; Gram: "PAGODA" Malad, Bombay 64.**
**Factory:** Plot No. 4, Mira Co-op. Industrial Estate, Mira, Dist. Thane. **Telephone: 663691**
**And Also Available At Ankleshwar (Guj).**

**ANKLESHWAR AMMONIA SUPPLY CO.**

**Plot No. 6508, GIDC, Ankleshwar, Gujarat.**
**ANKLESHWAR: (M. STD CODE No. 0264622) Tele.: 3010**

For your Requirements of:

**EDTA,NTA and their Salts**

Used in Agriculture, Textile, Rayon, Soaps and detergents, Rubber, Paper, Leather, Pharmaceuticals, Electroplating, Photography, Water-Softening, Paints, Plastics, Resins, Cosmetics and Various other Industries as Chelating/Sequestering/Metal Complexing Agents.

please contact manufacturers :-

**CHEMOFINE INDUSTRIES**
138, MADHANI ESTATE, 542, SENAPATI BAPAT MARG,
DADAR (W), BOMBAY: 400 028.
(Factory at Chembur, Bombay.)
Tel. Office: 4229932. Residence: 4220392.

PRINT DESIG

*Available in Bulk Quantity and ready stock*

**FRUSEMIDE I.P./B.P.**

**FENBENDAZOLE**

**C.P. MALEATE**

**DIMETHYL AMINO ETHYL CHLORIDE HCL**

**MEBENDAZOLE U.S.P.-22**

**MEBENDAZOLE U.S.P.-22** (White)

**RIFAMPICIN**

**ALBENDAZOLE**

**FLUBENDAZOLE**

**DIMETRIDAZOLE (VET)** (for export)

WANTED LOCAL AGENTS/STOCKISTS IN UNREPRESENTED AREAS

**TRANSCHEM PVT. LTD.**

56, Ridge Road, Malbar Hill, BOMBAY 400 006.
Phone: 8123636 - 8128608 - 8117511 - 8113334

For Quality And Quantity

**Mono Chloro Benzene (M.C.B.)**
**Para Di Chloro Benzene (P.D.C.B.)**
**Ortho Di Chloro Benzene (O.D.C.B.)**
**Tri Chloro Benzene (T.C.B.)**

Contact Manufacturers:

**CHEMIEORGANIC**

G-6, Everest, Tardeo, Bombay 400 034.
**Phones: 4949468/494195. Gram: SYNTHORGAN, Bombay-34. Telex: 011-76297 BABA IN**

---

**SOYA LECITHIN**
**CITRIC ACID**
**MONO SODIUM GLUTAMATE**
**PECTIN**
**COCOA POWDER**
**BHA**

Contact

**SESU TRADING CORPORATION**

4th Floor, Sai Chambers, 367/369, Narsi Natha Street, Bombay 400 009.
Phone: 320832/326402 Telex: 11-76387 Cable: TRASESU

---

For your requirements of

- Ammonium Fluoride
- Ammonium Bi-fluoride
- Ammonium Silicofluoride
- Ammonium Fluoborate
- Copper Fluoborate
- Chromium Carbonate & Hydroxide
- Chromium Fluoride
- Fluoboric Acid
- Lead Fluoborate
- Potassium Fluoride
- Potassium Bi-fluoride
- Potassium Silicofluoride
- Potassium Fluoborate
- Potassium Titanium Fluoride
- Sodium Fluoride
- Sodium Bi-fluoride
- Sodium Silicofluoride
- Sodium Fluoborate
- Tin Chloride
- Tin Fluoborate

Tin Sulphate

Please Contact Manufacturers

**RAJ FLUORINE & CHEMICALS**

D-6, Simit Shopping Centre, Char Rasta, G.I.D.C., Vapi 396 195 (Guj)
Tel: 1419 Resi: 2030

NAPHTHALENE
ACENAPHTHENE
ACETOPHENONE
CARBAZOLE
PURE PYRIDINE AND BASES
INDOLE
XYLENOL
COUMARONE INDENE RESINS
PETROLEUM RESINS
EXTENDERS FOR EPOXIDES AND POLYURETHANES

Contact:

CHIKA

**CHIKA LIMITED**
Bhupati Chambers, 13, Mathew Road, Bombay 400 004.
**Phones:** 8113456/1457 **Cable:** "DYECOLD" **Telex:** 11 75562 and 11 75534
**Branches**
**AHMEDABAD:** Ashram Road, **CALCUTTA:** 36, Ganesh Chandra Avenue
**MADRAS:** 122. Mount Road. **NEW DELHI:** 25/1. Asaf Ali Road

FOR YOUR REGULAR REQUIREMENTS OF:

SODIUM DICHROMATE

(Manufactured By: KONARK CHROME CHEMICALS PVT. LTD.)

Please Contact:

BHANWARLAL JHANWAR & SONS

201/203, NARSI NATHA STREET, ROOM NO. 9, 3RD FLOOR BOMBAY 400 009.
Phone: 8555289 - 863114 * Resl: 6735464

WE ALSO OFFER

HYDRAZINE HYDRATE 80% - MORPHOLINE - CYCLOHEXYLAMINE

Sterling

PETROLEUM BENZINE (PETROLEUM ETHER)
40°-60°/60°-80°/60°-95°/80°-100°/80°-120°/90°-100°/100°-120°
HEXANE 65°-70° EMULSIFYING WAX

* *

AROMATIC CHEMICALS

* *

AMYL BUTYRATE ETHYL BUTYRATE BUTYL BUTYRATE
ISO BUTYL BUTYRATE ISO AMYL ACETATE AMYL PROPIONATE ETHYL PROPIONATE
SCHAEFFER'S ACID (AS SODIUM SALT) (Export Enquiries Solicited)

Contact Manufacturers

STERLING ORGO & INORGO CHEMICALS P. LTD.

**Regd. Office:** 340/42, Samuel Street, Raut Chamber, 4th Floor, Bombay 400 003.
**Phones: 333601/333602/338722 Telex: ASIM IN 73145 Fax: 331738**
**Factory:** Plot AF-1, Cama Industrial Estate, Walbhat Road, Goregaon (East), Bombay 400 063.
**Phone: 6730458/6734593/6734650 Resl.: 352625/364354/8114061**

INTRODUCING

LIQUID $SO_3$

OLEUM 65%, OLEUM 23/25% & SULPHURIC ACID 98%
SULPHURIC ACID BATTERY GRADE (Concentrated)

PLEASE CONTACT THE MANUFACTURERS

GOPALANAND RASAYAN

(A Division of the Indian Link Chain Mfg. Ltd.)

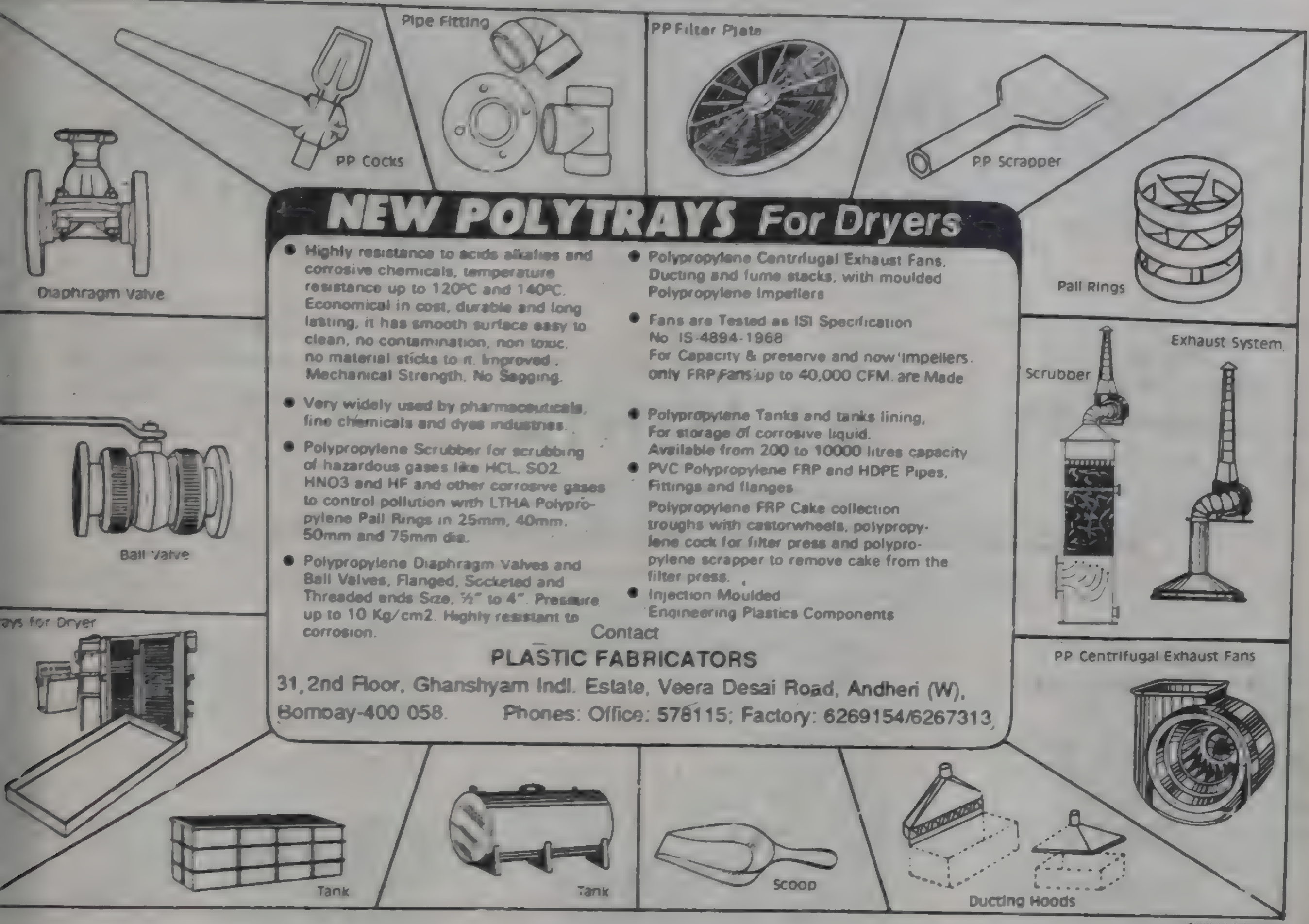
We ensure

* REGULAR SUPPLIES ON LONG TERM BASIS * MEETING WITH ALL I.S.I. SPECIFICATIONS
* PROMPT DELIVERY AS PER YOUR SCHEDULE

**Registered Office:**
Lal Bahadur Shastri Marg,
Bhandup (West),
Bombay 400 078.
Tel. No.: 582311/586803

**Marketing Division:**
59, Sonawala Building, 2nd Flr.,
Bombay Samachar Marg,
Bombay 400 023.
Tel. No.: 256519/317387

**Factory:**
Plot No. D 18,
M.I.D.C. Boisar,
Tarapur 401 506. Dist. Thane
Tel. No.: 2421/2422



**NEW POLYTRAYS For Dryers**

- Highly resistance to acids alkalies and corrosive chemicals, temperature resistance up to 120ºC and 140ºC. Economical in cost, durable and long lasting, it has smooth surface easy to clean, no contamination, non toxic, no material sticks to it. Improved. Mechanical Strength. No Sagging.
- Very widely used by pharmaceuticals, fine chemicals and dyes industries.
- Polypropylene Scrubber for scrubbing of hazardous gases like HCL, SO2, HNO3 and HF and other corrosive gases to control pollution with LTHA Polypropylene Pall Rings in 25mm, 40mm, 50mm and 75mm dia.
- Polypropylene Diaphragm Valves and Ball Valves, Flanged, Socketed and Threaded ends Size. ½" to 4". Pressure up to 10 Kg/cm2. Highly resistant to corrosion.
- Polypropylene Centrifugal Exhaust Fans, Ducting and fume stacks, with moulded Polypropylene Impellers
- Fans are Tested as ISI Specification No IS-4894-1968 For Capacity & preserve and now 'Impellers. only FRP Fans up to 40,000 CFM. are Made
- Polypropylene Tanks and tanks lining, For storage of corrosive liquid. Available from 200 to 10000 litres capacity
- PVC Polypropylene FRP and HDPE Pipes, Fittings and flanges Polypropylene FRP Cake collection troughs with castorwheels, polypropylene cock for filter press and polypropylene scrapper to remove cake from the filter press.
- Injection Moulded Engineering Plastics Components

Contact

**PLASTIC FABRICATORS**

31, 2nd Floor, Ghanshyam Indl. Estate, Veera Desai Road, Andheri (W),
Bombay-400 058. Phones: Office: 578115; Factory: 6269154/6267313

NOW AVAILABLE EX-FACTORY/EX-BOMBAY
PRESTIGEOUS PRODUCT OF "CALIRON GROUPS"

**SODIUM HYDROXIDE PELLETS Pharma Grade**

(AS PER IP/BP STANDARD SPECIFICATION)

**EX-FACTORY @ Rs. 18.50 PER KILO &
EX-BOMBAY GODOWN @ Rs. 21.50 PER KILO**

ALSO AVAILABLE REGULARLY LR & AR GRADES SODIUM & POTASSIUM HYDROXIDE PELLETS, SUCCINIC ACID EXTRA PURE AND ITS SALTS, GUANIDINE NITRATE E.P.

Manufactured by: "CALIRON Group of Industries"

M/s. CALIRON CHEMICALS
M/s. CALIRON ORGANICS
M/s. CALIRON SYNTHECHEM PVT. LTD.
M/s. P.V.N. CHEMICALS
Address: P.O. Box 184, LUDHIANA - 141 008.

PLEASE CONTACT SELLING AGENT/BOOKING AGENT/AUTHORISED STOCKIST

indenta Chemicals (INDIA)
PRIVATE LIMITED

201, Adamji Building, 2nd Floor,
Katha Bazar, Syed Mukri Street,
Bombay - 400 009.
Cable : INDUMADI, BOMBAY 400 009.
Tel.: (Off.) 34 38 75 & 34 98 20
(Res.) 634 80 47
Telex: 011-73098 INDU IN
Fax.: 91 22 8513212 ATT: I0011-INDENTA

**ALWAYS AVAILABLE**

HYFLOSUPERCELL
DICALITE
CITRIC ACID
PECTIN

MELAMINE
PHENOL
PARAFORMALDEHYDE
BUTYL ACRYLATE

LITHOPONE
HYDROGEN PEROXIDE
FORMIC ACID
TARTARIC ACID

Phone:
Resl: 6442063
Office: 345506/347879

Please Contact:

**B.I. MEHTA**

Telex No.
C/o. 11-75617 MMCB IN
Fax: 00-91-22 325620
Attn.: B.I. Mehta

2-B, Ganga Vihar 94, Kazi Sayed Street, Bombay 400 003.

**WE ALSO BUY/SELL REP-EXPORT HOUSE LICENCE**

FOR YOUR REQUIREMENTS OF:

FURAZOLIDONE BP
SODIUM SACCHARINE IMP.
INDOMETHACIN BP/USP
LACTIC ACID BP/USP (IMP)
PROPIONIC ANHYDRIDE
DIMETHYL ACETAMIDE
DIMETHYL CARBONATE
2,6-LUTIDINE
DIMETHYL DICHLOROSILANE
DIETHYL CARBONATE
B-HYDROXY ETHYL HYDRAZINE
L-LYSINE HCL (Pharma)

5-NITRO-2-FURFURALDEHYDE DIACETATE
PIVALOYL CHLORIDE
GUM ROSIN
AMINOPHYLLINE
EPHIDRINE HCL
HYDRAZINE HYDRATE
HYDROXYLAMINE HCL
MAGNESIUM CARBONATE IP
PYRIDINE HYDROBROMIDE
BIS-TRIMETHYL SYLYL UREA
ETHYL CHLOROFORMATE

2-ETHYL HEXOIC ACID
5-SULPHO SALICYLIC ACID
TRIPHENYL PHOSPHINE

*PHOTOGRAPHIC GRADE*

SODIUM THIOSULPHATE (EX)
SODIUM CARBONATE (EX)
POTASSIUM META BISULPHITE
SODIUM SULPHITE
SODIUM METABISULPHITE
HYDROQUINONE

CONTACT:

**M/s. KIRAN CHEMICALS**

178, Sant Tukaram Road, 1st Floor, BOMBAY 400 009.
Phone: 8512053/8517313/8728929 Resi: 4076078/4078231/4077254/4075799

We Offer A Best Quality at a Very Competitive Rates
For your Small & Bulk Requirements Of:

**Phosphorous Tri Chloride ($PCl_3$)**
**Phosphorous Oxy Chloride ($POCl_3$)**
**Phosphorous Pentoxide ($P_2O_5$)**
**Tri Ethyl Phosphate (TEP)**
**Tri Chloro Molybdenum Phosphide (TCMP)**

Please Contact Manufacturers:

**SANDHYA DYES & CHEMICALS**

**Regd. Office & Works**
Plot No. 1703, G.I.D.C. Sarigam,
Sarigam 396 155, Bulsar, Gujarat.
Phone: 149 (Bhilad Exchange)

**Bombay Sales Office:**
5/7, Modern Villa Building,
7th Road, Santacruz (East), Bombay 400 055.
Phone: 6146516

**ROHAN DYES AND INTERMEDIATES**
**(AHMEDABAD)**
**FOR YOUR REQUIREMENTS AS PER INTERNATIONAL STANDARD TOP IN QUALITY**

- GAMMA ACID
- G. SALT
- R. SALT
- META UREIDO ANILINE HCL
- K. ACID
- AMIDO G. SALT
- S.P.C.P.
- S.P.M.P
- 2.5 DICHLORO S.P.M. P.
- P.M. P.
- SULFANILIC ACID (TECH. GRADE)
- SULFANILIC ACID (PURIFIED)
- SCHAFFER'S ACID
- 4-NAP
- 4-NAPSA

AND SHORTLY INTRODUCING MANY NEW ITEMS & A RANGE OF DIRECT, ACID AND REACTIVE DYES

**ROHAN DYES & INTERMEDIATES**

**OFFICE :**
189, NEW CLOTH MARKET,
AHMEDABAD-380002.
PH. : 368171 & 360758, FAX : 272-346412
TELEX : 1216942 JITM IN

**BOMBAY OFFICE :**
2ND FLOOR, PUSHPAWATI BLDG. NO. 2,
CHANDANWADI, GIRGAON ROAD,
BOMBAY-400002.
TEL. 256740 , 298224 TLX : 01182383

**FACTORY :**
115, GIDC, PHASE I, VATVA,
AHMEDABAD-380045.
PH. : 831131-2, 833771 & 834469

**DISTRIBUTOR :**
RONAK ENTERPRISES
B/2, RAJDEEP PARK FLATS,
BALIAKAKA RD., AHMEDABAD.
TEL. : 396719 & 395475.

*We Manufacture*

**DIPHENYL METHANE**
**BENZOPHENONE**
**BROMOBENZENE**

**SUMEEKA CHEMICALS PRIVATE LIMITED**

APEEJAY BLDG., FOURTH FLOOR, BOMBAY SAMACHAR MARG, FORT,
BOMBAY - 400 001, INDIA.

Phone: 224084 (3 lines), 242703/244652
Telex: 1184158 KMTX IN
Grams: 'CHEMTREE' Bombay-400 001

For Your Small & Bulk Requirements Of:

**Morpholine * Phosphorous Trichloride * Tributyl Phosphate**
**Phosphorous pentoxide * Phosphorous Oxychloride**
**Mono Ethanolamine * Tri Ethanolamine * Diethanolamine**

PLEASE CONTACT:

**S.I. CHEMICALS & TRADING CO. PVT. LTD.**

65, Bombay Samachar Marg, Sonawala Building, 2nd Floor, Bombay-400 023
Phone: 286 34 18, 286 12 36. Cable "SICORPOBOM" Telex: 11-5028 CHEM-IN

FOR YOUR REGULAR REQUIREMENTS AND EXPORT

*** DYES:**
(NAPHTHOLS, RED TR BASE, RED KB BASE, SALTS, RAPIDOGENS)

*** INTERMEDIATES:**
META NITRO ANILINE (MNA)
META DI-NITRO BENZENE (M-DNB)

CONTACT:
**DALAL ENTERPRISE**

* ANTHRAQUINONE

* ORTHO BENZYL BENZOIC ACID (OBB)

* BENZANTHRONE

CONTACT:
**PHOENIX PETROCHEMICALS PVT. LTD.**

*FACTORY:* PLOT NO. 7, G.I.D.C. ESTATE, NARODA, AHMEDABAD 382 330, INDIA
*OFFICE:* SHANTIKUNJ, PALDI, AHMEDABAD 380 006, INDIA.
**Telephone: (O) 78520, 76042; (F) 811519, 810305**
**Telex: 0121-7071 RAVI-IN * Fax: 272-411148**

We also invite interested parties for area distributorship

**AMMONIA** Gas

Purity-99.5%
In Cylinders of 40 kg./50 kg.
In Tankers of 500 kg.
In Road Tankers of 5, 6, 6.5 M.T.

**AMMONIA** Liquor

Sp. Gravity 0.910 & 0.888.
In Road Tankers, Drums & Carboys

Please Contact:

***JAYSONS CHEMICAL INDUSTRIES***

SAKI VIHAR LAKE ROAD, POST BOX NO. 8968, SAKINAKA, BOMBAY - 400 072

**Phones: 582704/589205/589208**

**Grams: JAYSONS--Bombay-400 072**

BRANCHES

261, Kandla Kashan Street,
Delhi-110 006
**Phone: 235516**
**Gram: 'JAYCI'**

Plot No. 317/7, G.I.D.C.,
Vapi, Dist. Bulsar-396 195
**Phone: 1689**

18-A, Mai Krupa Society,
Old Channai, Highway Road,
Baroda
**Phone: 22161**

# ETHANOLAMINES

(Pioneer Manufacturers in India)

**MONO-ETHANOLAMINE**
**DI-ETHANOLAMINE**
**TRI-ETHANOLAMINE**

---

**TRI-ETHANOLAMINE LAURYL SULPHATE**
**COCO-MONO-ETHANOLAMIDE**
**COCO-DI-ETHANOLAMIDE**
**DI-ETHYLENE GLYCOL (DEG)**

---

**P.K. VELU & CO. (PTE) LTD.**

111. Mahatma Gandhi Road, Bombay 400 001.
**Tel. 274123 / 5557161 * Telex: 11-82528 VELU IN**

---

ATTENTION

SCANOMAX

**SCANOMAX INDIA LIMITED**

OFFERS

**BULK DRUGS & DRUG FORMULATIONS**

**AT REASONABLE PRICES**

- 6 APA
- AMPICILLIN TRIHYDRATE I.P./B.P.
- ATENOLOL B.P.
- AMOXYCILLIN TRIHYDRATE I.P/B.P.
- CEPHALEXIN I.P.
- CLONIDINE I.P.
- MEBENDAZOLE I.P.
- GLIBENCLAMIDE I.P.
- PIROXICAM I.P.
- NIFEDEPINE I.P.
- IBUPROFEN I.P/B.P.
- CLOXACILLIN SODIUM I.P.
- FURSEMIDE I.P.
- CHLORAMPHENICOL I.P.

CONTACT

**SCANOMAX INDIA LIMITED**

**Admn. Office.**
2504, Sector 35-C
**CHANDIGARH.**
Phone — 43058
Telex 395 237, PIDC IN

**Works.**
Vill. Channo,
23 KM Stone on
Patiala Sangrur
Highway, Distt.
**SANGRUR.** (PB.)

**BRANCH OFFICES**

Flat No. 916, 9th Floor
Arunachal Building
Barakhambha Road
**NEW DELHI**

184, Poonamallee High Road,
Post Box No. 1006,
**MADRAS-600 010**

4-B, Little Russell Street
**CALCUTTA-700 071**

Available Regularly at Competitive Rates Ex-Stock/Ex-Factory

**SODIUM NITRITE * SODIUM NITRATE**

Mfrd. by: M/s. SONIL Div. of M/s. CHEMCROWN (INDIA) LTD.

**RIFAMPICIN I.P. (COMPACTED)**
**IBUPROFEN I.P.**
**PHENOBARBITONE I.P.**
**2-AMINO-4-CHLORO PHENOL**
**OCTYL ACETATE**

Mfrd. by: M/s. CUREKRAFT CHEMICALS (I) PVT. LTD. Divn. of M/s. CHEMCROWN (I) LTD.

**PARA TERTIARY BUTYL PHENOL -- PTBP**
**DITERTIARY BUTYL PARA CRESOL -- DBPC (BHT)**

Indenting Agent of M/s. Balmer Lawrie & Co.

Please Contact:

**CHEMCROWN INDIA LTD.**

D/3, Poonam Apartments, Dr. A.B. Road, Worli, Bombay 400 018.
Phone: 4928386/4928737 * Telex: 011-71758 CHEM IN
CALCUTTA OFFICE: 295652/290218 * DELHI OFFICE: 3317051/3316666 * KANPUR OFFICE: 211641/211825 * MIRZAPUR OFFICE: 3580

Are you Quality Conscious?

**USE BRILEX ACTIVATED CARBON**

A trusted name in Quality for over two decades. Grades equivalent to International Standards as per NORIT, DEGUSSA, TAKEDA and MERCK or as per your specification both powder and granules.

Please Contact

**SUNEETA CHEMICALS**

33, Satnam Bldg., Opp. World Trade Centre, Cuffe Parade, Bombay 400 005
Tel: 216728/213835 Gram: BRILCHEM

**SPECIALITY CHEMICALS**

* Ethylene Oxide Condensate
* Propylene Oxide Condensates And Co-polymers
* SLES, TEALS, Cocodiethanolamide
* Synthetic Lubricants for high temperature service
* Industrial Liquid Detergents
* Tailor-made Spin Finish Oils and Coning Oils for Synthetic Fibre/Yarn
* Speciality Chemicals tailor-made to Customer's requirements

**UNITED PESTICHEM & NONIONICS PVT. LTD.**

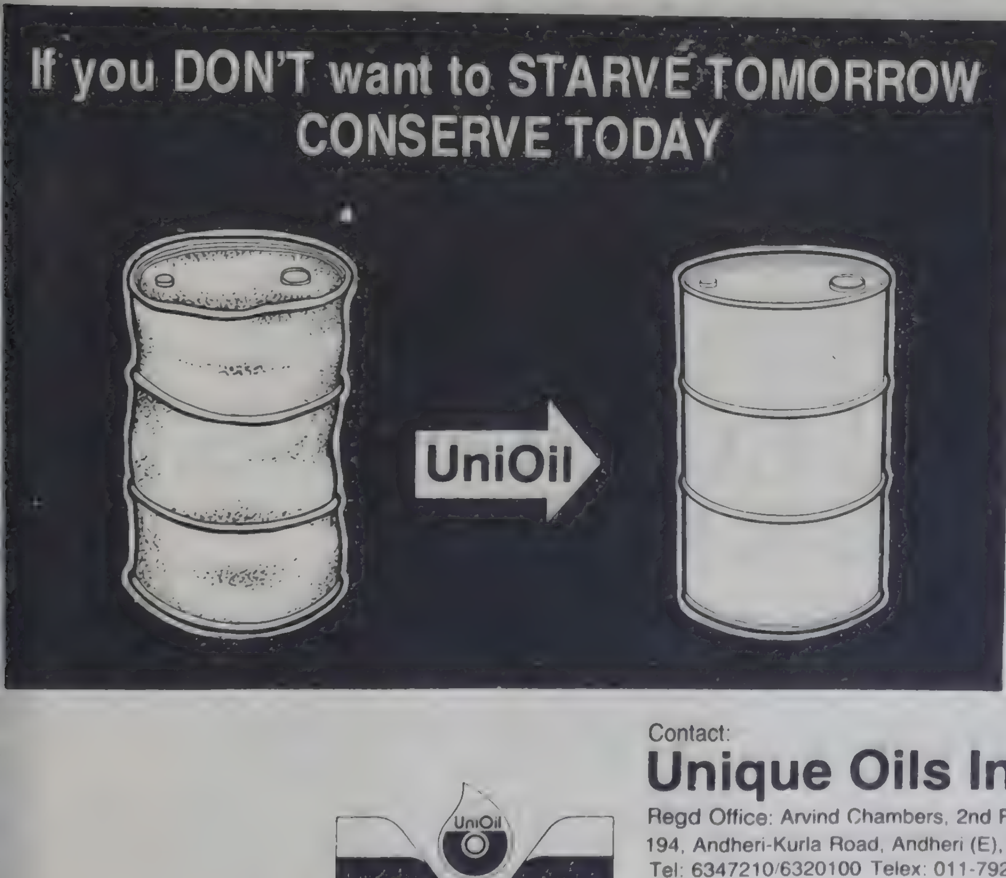
"AHURA", 84 Sion Road, Sion East, Bombay 400 022.
Phone Nos.: 4074295/96; 4073355; 4091752

# DIAM ORGANIC CHEMICAL INDUSTRIES (P) LTD.

Manufacturer Offers (Ex-Stock)

**Ethyl Cellosolve (Ethylene Glycol Mono Ethyl Ether)**
**Ethyl Carbitol (Di-Ethylene Glycol Mono Ethyl Ether**
**Higher/Glycol Ethers (High ERBP) For Brake Fluids**
**Tri Ethanolamine (85%) Technical Grade**

Contact:
*Bombay Office:* Crescent Chambers, First Floor, Tamarind Street, Fort, Bombay 400 023.
**Tel.: 272341, 276239, 272339**
**Tlx.: 011-85644 TAPS IN**
**Cable: 'CHERRY', Bombay 400 036.**



If you DON'T want to STARVE TOMORROW
CONSERVE TODAY
UniOil

UNIQUE OILS INDIA LTD.
CAN SHOW YOU THE WAY

Their State-of-the-art drum reconditioning plant at Tarapur can bring back your old drums to AS NEW condition and give new lease of life to them. The process is cost-effective too. A large number of users of drums are reaping the benefits. WHY NOT YOU???

Their sophisticated used oil re-refining plant can purchase all your used lubricating oil for scientific re-refining. Give your used oil to them and prevent its use for spurious purposes. Contribute towards saving country's foreign exchange.

Contact:
**Unique Oils India Limited**
Regd Office: Arvind Chambers, 2nd Floor, (Gouri Studio Comp.),
194, Andheri-Kurla Road, Andheri (E), Bombay-400 069
Tel: 6347210/6320100 Telex: 011-79292 UOIL IN • Fax 009122-636 4654
Factory: Plot M-4, MIDC Industrial Estate,
Tarapur, Dist. Thane, Maharashtra, Telex: 0132-236 UOIL IN Tel: 2892

Pulse

For Your Requirements Of:

**ZINC ASH, ZINC DUST, ZINC OXIDE** (OFF COLOUR)
**BRASS ASH & COPPER ASH**

Very Suitable for

Zinc Sulphate & Copper Sulphate

WE PURCHASE

Scrap -- Waste -- Ash -- Residues of

NICKEL -- TIN -- COBALT AND OTHER NON-FERROUS METALS

Please Contact: **HINDUSTAN METALS**

13, Broadway Shopping Centre, 1st Floor, Dadar T.T., Bombay-400 014
Phones: 4121356/4127014
Gram: 'RESIDUE' Bombay-400 014

**WE MANUFACTURE AS PER SPECIFICATION**

(1) SODIUM SILICATE ALKALINE & NEUTRAL LIQUID AND LUMP ALSO IRON FREE
(2) POTASSIUM SILICATE
(3) SODIUM META SILICATE $9H_2O$ & $5H_2O$

**SAPANA CHEMICAL INDUSTRIES**

19, BARODA CO-OPERATIVE INDUSTRIAL ESTATE,
CHHANI ROAD, BARODA- 390 002
PHONES : (F) 21950 (R) 21911

AVAILABLE INDIGENOUSLY

**SELENIUM SULFIDE (U.S.P.)**
**SELENIUM DIOXIDE**
**SODIUM SELENITE** **SODIUM BISELENITE**
**SELENOUS ACID**

Contact Manufacturers:

**OMKAR CHEMICALS**

*Office:*
23, Vrindavan, Four Bungalows Road,
Andheri (W), Bombay 400 058.
Phone: 6238996

*Factory*
W-92(A), MIDC, Badlapu
Dist. Thane, Maharashtra - 421 50

**FLUORINE BASED CHEMICALS**
Manufactured with **SWISS/GERMAN** Knowhow
Available Ex-stock

**SODIUM ALUMINIUM FLUORIDE (CRYOLITE)**
**AMMONIUM BIFLUORIDE**
**FLUOBORIC ACID**
**POTASSIUM BIFLUORIDE**
**POTASSIUM FLUORIDE**
**SODIUM SILICO FLUORIDE**
**SODIUM MONOFLUORO PHOSPHATE**
**SODIUM BIFLUORIDE**
**SODIUM FLUORIDE**
**COPPER, LEAD, TIN FLUOBORATES**
**HF ACID (ELEC. GR)**
**HF ACID (ANHYDROUS)**
**HF ACID (40%, 60%, 70%)**

Can also manufacture any other special Fluorine Chemicals to your specification.
Please Contact Manufacturers:

**TAMILNADU FLUORINE AND ALLIED CHEMICALS LTD.**

*Regd. Office:*
No. 5-C, II Street, Dr. Radhakrishnan Road,
Mylapore, Madras 600 004.
**Tel.: 846138, 846071. Tlx.: 041-6463 TFAC-IN**

*Works:*
Plot No. 14, SIPCOT Industrial Complex,
Cuddalore 607 003, Tamil Nadu.
**Tel.: 2321, 2121. Tlx.: 0462-204 TFCL-IN**

AGENTS

**M/s. HINDUSTAN CHEMICAL CO.**
77B, Juhu Supreme Centre, Gulmohar Road,
Bombay-400 049
**Tel.: 6205464, 6204121**

**M/s. RANA DYES CORPORATION,**
Sringeri Mutt Complex, 1st Floor,
K.V. Temple Street, Sultanpet,
Bangalore 560 053. **Tel.: 77417**

**M/s. RAM-NATH & CO.**
123, Angappa Naick Street, Madras 600 001.
**Tel.: 580623, 585843, 837773, 431006.**
**Tlx.: 041-7399 RANA IN**

**M/s. DECCAN ORGANICS,**
1-8-158/160, Plot. 10, P.B. No. 1503
Prenderghast Road, Secunderabad 500 003
**Tel.: 844857, 840729. Tlx.: 0425-6535**

---

ATTENTION MANUFACTURERS OF DYESTUFFS, DYE INTERMEDIATES, BULK DRUGS AND BULK DRUG INTERMEDIATES

Regularly Available on Competitive terms

**ACETANILIDE**
**OF ULTRA PURE QUALITY**

INTRODUCING SHORTLY

ANILINE OIL
N,METHYL,N,HYDROXY ETHYL ANILINE
OXYETHYL NITRO ANILINE
N,N,DIHYDROXY ETHYL META TOLUDENE
N,ETHYL-N-HYDROXY ETHYL ANILINE
N,N,DIHYDROXY ETHYL ANILINE
N,N,DIHYDROXY ETHYL META CHLORO ANILINE

Contact Manufacturers

**VASUDHA CHEMICALS PVT. LTD.**
501, Sai Ashish A-Wing, Balrajeshwar Road, Mulund (W), Bombay 400 080.
**Tel: 5604382/5613921** **Fax: 91-22-5603680** **Tlx: 011-71030 DELT IN**

WE THANK OUR CUSTOMERS FOR KIND
CO-OPERATION AND PATRONAGE GIVEN TO US
DURING OUR TENURE OF SERVICE FOR LAST
THREE YEARS

**KINDLY NOTE CHANGE OF ADDRESS**

**NEW ADDRESS** : **SATYAN PHARMACEUTICALS PVT. LTD.**
403, VISHWA NANAK APARTMENT, CHAKALA,
ANDHERI-GHATKOPAR LINK ROAD,
ANDHERI (E), **BOMBAY - 400 099**

**NEW TELE. NO.** : 636 7642

**NEW TELEX NO.** : 011-79429 SPL IN

**FAX NO.** : 620 9477

**BRANCH OFFICE** : 114, THAMBU CHETTY STREET,
**MADRAS - 600 001.**

**TELE. NO.** : 51 39 67 / 51 08 51

CONTACT FOR MOST COMPETITIVE CIF PRICE IN

**CHEMICALS, PHARMA RAW-MATERIALS &**

**DYES-INTERMEDIATES**

# Chemical Weekly

VOL. XXXV

SEPTEMBER 4, 1990

NO. 52

**Publishers:**
**SEVAK PUBLICATIONS**

*Editor - Publisher*
**R. RAGHAVAN**

*Advertisement Manager*
**N.R. RAJAGOPALAN**

*Administration/Circulation*
**VIJAY RAGHAVAN**

*Editorial & Administrative Office:*
306, Shri Hanuman Industrial Estate
G.D. Ambekar Road, Wadala,
BOMBAY 400 031.
Phones: 4120743/4131198.
Telex: 011-76053 CWLY IN

*Madras Office:*
Room No. 9, Wellingdon Estate,
3rd Floor, 24, Commander-in-Chief
Road, Madras 600 105
Phone: C/o. 471659.
Telex: 041-6290 CWLY IN.

*Printed at:*
Sevak Publications,
25, North Mada St., Thiruvanmiyur,
Madras 600 041.

Fast Print Service,
307/308, Shri Hanuman Indl. Estate,
G.D. Ambekar Road, Wadala,
Bombay 400 031.

**Subscription Rates:**
**(Inclusive of Postage)**
India: Rs. 400.00
Foreign: US$ 175.00 (Air Mail)
US$ 75.00 (Sea Mail)

***Subscription charges payable in advance in favour of SEVAK PUBLICATIONS***

## CONTENTS

Heralding the 21st Century: Emerging trends in bulk transport of materials — A review — T.P.S RAJAN 41
Chemarena — S.L. VENKITESWARAN 45

### IN THE NEWS

Battery technology: Silent revolution on 50
ICICI, associates to fund Reliance expansion 51
Iodised salt production to be stepped up 52
UB Petro to commence supplies of import substitution chemicals 62
Large inventory of acrylates of IPCL 73

### PHARMACEUTICAL CAPSULE

Bulk drug plant at Ankleshwar: Rhone Poulenc surrenders licence 48
Doxycycline price cut 52
Drug companies turn to exports to get around control 54
Sequel to illegal imports at low prices: Penicillin units shy away from market 55
Drug companies seek more say in DPCO review panel 56
Lyka writ against DPEA demand 58
Rs. 2.63 crore KAPL modernisation plan 60
Hoechst Ankleshwar complex inaugurated 61

### OIL AND NATURAL GAS SCENARIO

OPEC close to production hike pact 74
Creation of gas pool account opposed 75
Imported items ready for RPL gas turbine plant 76
New gas pricing norms unjust: GCCI 76
Positive US & Soviet response to oil supply 77
Assam gas cracker project: MacNeill & Magor awaits Govt. response 78

### PLASTICS NEWS

Sanghi Polyesters to set up PFY project 79
FRG know-how for Finolex PVC resin project 80

### ENVIRONMENT NEWS

Small paper units told to devise anti-pollution kits 81
Once an oasis, now a poison tank 82
Axe on environments ministry: Only major projects need clearance 83
Kerala monazite beaches cause radiation risk 84
Effluent treatment plants: Environment Ministry offers to arrange credit 85

### MINERALS AND METALLURGICAL FRONT

Ferric oxide manufacture: NMDC's pilot plant opened 86
SAIL plants incur Rs. 872 crore loss in four years 87
Funds for IPRS: Move to raise cess on steel, pig iron 88

### SPECIAL ARTICLE

Industrial and Export Opportunities of other Petrochemicals — P.S BALASUBRAMANIAN 105

### REGULAR FEATURES

Spotlight on Biotechnology and Life Sciences 88a
Food and Pharmaceutical Technology in Perspective 91
Science Briefs 97
New Products 101

### INTERNATIONAL SPECTRUM

Chemical News from Abroad 113
Chemical Markets Abroad 117
Biotechnology 120
Technological Scene Abroad 122
News About New Projects 125

### MARKET INFORMATION

Bombay Chemicals Market 129
Bombay Dyes Market 134
Delhi Market 136
Madras Market 137
Calcutta Market 137
Shipping News 138
Materials Imported/Exported 141

Now Freely Available

**CAUSTIC POTASH FLAKES**
**CAUSTIC SODA FLAKES/LYE**
**CHLORO SULPHONIC ACID**

Manufactured by
**The Andhra Sugars Ltd.**

**HYDRAZINE HYDRATE** All Grades

Manufactured by
**The Andhra Farm Chemicals Corpn. Ltd.**

श्री

SHREE ENTERPRISES
(CHEMICALS) PVT. LTD.

A Shree Group

801, Dalamal Towers, 211, Nariman Point, BOMBAY-400 021.
PHONES: 231336 □ 231308 GRAM: "ANHYDRIDE" TELEX: 011-5179

CHEMICAL WEEKLY

VOL. XXXV SEPTEMBER 4, 1990 NO. 52

## HERALDING THE 21st CENTURY - 65

# Emerging trends in bulk transport of materials — A review

The use of pipelines for the transport of materials is gaining acceptance as a viable form of materials handling. Today pipeline systems are used for both short hauls and ong-distance transportation of a wide variety of commodties. Pipelines are an undisputed mode of transport for water, oil, natural gas and other fluids. In the US alone there are more than 330,000 km of oil pipelines, 380,000 km of inter-State gas pipelines and 1,500,000 km of water pipeline.

Freight pipelines too are now a well established technology. Environmental considerations coupled with the favourable economic aspects of freight pipelines are resulting in widespread implementation of these systems. Freight pipelines is a generic term used to describe four basic modes of solids handling systems:-Pneumatic (P); Pneumo capsule (PC); Hydraulic (H); and Hydro capsule (HC). Each system is discussed in terms of its application in the materials handling spectrum. A freight pipeline system consists of seven basic components:-the freight; the pipeline; the conveying medium; the prime mover (pump, blower,compressor); the feeder (to introduce commodity into pipeline and conveying medium); the separator (to separate the commodity from the medium); the separator (to separate the commodity from tne conveying medium and the pipeline); and auxiliary control facilities.

**Main Features.** Under favourable conditions, freight pipelines offer many advantages when compared with alternative transportation modes. In particular, they offer the following features:

-- Protection of product from the environment.
-- Protection of environment from the product.
-- Flexibility of routing (vertical and horizontal).
-- Distribution, to many different areas in a plant and pickup from several areas.
-- Exceptionally low maintenance costs.
-- Reduction in number of operating personnel.
-- Multiple use — a single pipeline can be used for a variety of products.
-- Security — pipelines can be used to transport high value products.
-- All-weather operations.
-- High degree of reliability end load factor.
-- Simplicity of installation as compared with a new highway or railroad, particularly attractive in mountainous areas.
-- Less sensitive to inflation.

One of the most significant features of freight pipelines is the environmental issue. By virtue of the fact that pipelines can be buried and that the product is contained in a closed conduit, many of the decision making bodies are being persuaded to seriously consider freight pipelines. Such decisions should be seen in the light of the growth of the need to transport hazardous materials. It has been recognised that freight pipelines would be one of the most effective ways to reduce the likelihood of injury, death or loss of property.

**Pneumatic Pipeline.** Pneumatic conveying technology is in the main restricted to inhouse, short distance, transportation requirements. However, more recently systems for transporting materials over distances of 3,000 m have been developed. A wide range of products can be transported in a pneumatic system. Products ranging from sub-micron sized powders to 80 mm lumps of quartz rock, from asbestos fibres to delicate coffee granules are all amenable to safe and reliable transfortation in a pneumatic system. There is a wide range of specialised hardware available to facilitate the transportation of most dry powdered and granular materials.

By virtue of its clean operating characteristics, pneumatic conveying systems are extensively used in the food indus-

y. Most modern-day flour mills are designed using solely neumatic conveying technology to effect the total milling operation. Sugar, live chickens, fish and the like are also ransported in such systems. More recently pneumatic conveying technology is being introduced into the mining industry. Systems for hoisting of mined materials to the surface, he transport of materials to worked out areas for backfilling nd the transport of ice for cooling of deep mines are a reality. The implementation of pneumatic conveying systems must be seen in the light of the high power requirements as compared with the mechanical equivalent. The justification for a pneumatic transport system can only be based on the numerous advantages in terms of manpower, reliability, low maintenance costs and other factors.

**Hydraulic Pipeline.** Hydraulic pipeline technology is well proven and there are a large number of successfully operating pipelines all over the world. Commercial hydraulic pipelines are transporting a wide range of products (coal, gravel, iron ore, gold tailings, sulphur, lime) over distances in excess of 600 km at rates of 16 million tonnes a year. To appreciate the efficiency of a hydraulic pipeline, the case of Savage River Iron Ore Pipeline (Tasmania) may be cited. This pipeline delivers 2.5 million t/a of iron ore from the mine to a loading port 85 km away. A 228 mm diameter pipeline is used. In order to effect the same transportation rate, a unit train consisting of 65 one hundred tonnes trucks would have to enter the mine each day and a second equivalent train would have to leave the mine fully laden each day. Grinding and dewatering costs form an appreciable component of the total operating costs of hydraulic systems. In addition it must be borne in mind that depending upon the material transported, the carrier fluid (water) is in most cases heavily poluted. In many instances, it is not possible to dispose of this water without treatment. Further, the acceptability of a hydraulic pipeline is also a function of the availability of water. In many situations, water limitations could dictate the need for a second return pipeline to recirculate the water.

**Pneumo Capsules.** In pneumo capsule pipelines the solids are encapsulated in a container. The modern systems operate under a positive pressure, and the capsules are fitted with multiple wheel bogies at either end. The capsules are propelled using air supplied from a low pressure blower. Most systems are designed to operate at pressures less than 100 kPa gauge and speeds of the order of 30 km/h. For optimum transportation efficiencies, capsules are linked together to form a capsule train. Perhaps the most crucial aspect of these systems is the loading and unloading of capsules.

Currently, an experimental pipeline is being installed by the University of the Witwatersrand in South Africa. This pipeline has been designed to effect a loading or unloading operation in less than 10 seconds.

An important feature of pneumo capsule technology is the ability to transport capsules over long distances. By employing flap type booster stations, it is possible to transport capsules over any distance required. The commercial application of large capsule systems is limited to several systems operating in Russia. The longest system (Lilo 2) transports materials in a 1,220 mm diameter pipe over a distance of 49 km. Eight capsules form a train and each train is capable of handling 36 tonnes of material. The Lilo 2 system has a total of 25 trains and operates at a maximum pressure of 40 kPa absorbing a total of 250 kW per station in the loaded mode. There is a total of 10 booster stations and the system transports 2 million t/a. Capsules are propelled at a speed of 45 km/h and each capsule in 3.3 m long and 1,000 mm in diameter. An important feature of pneumo capsule systems is their relatively low power consumption and ability to traverse over almost any terrain. Careful positioning of booster stations will ensure minimum energy consumption.

When comparing pneumo capsule systems to alternative transportation modes, it must be borne in mind that the comparison must be based on the alternative providing the same features as the capsule system. Further it must be realised that the capsule system requires some method of returning empty capsules.

**Multipurpose pipeline.** The second phase of freight pipeline development has already commenced. Research and development is taking place on a broad front. The prime objective of most research programmes seems to be to improve further the efficiency of the conventional freight pipeline systems. The second phase developments are also concerned with the multiple employment of the pipe system. As such, the pipeline is being viewed beyond the scope of the transportation system. Pipelines of the future will be integrated with other transportation systems, with chemical processes requiring intransport processing, with two-way transportation both into and away from single stations, with high energy infeeds into power plants, etc.

**Reactor pipeline.** The reactor pipeline concept could provide the user with an economic solution in which both the processing function and the transportation function could be effected in a single system. Careful design of the pneumatic conveying system could permit a wide range of processing operations during transportation. The feasibility of combining the functions of chemical reaction during the transportation process has been investigated by the author. In trials using a pressure vessel as both a reactor vessel and a pneumatic feeding device, steam was used to initiate the chemical reaction and provide the conveying gas. The tests proved to be successful. The reactor pipeline concept has also been discussed in the context of hydraulic pipelines. One of the uses of such a pipeline would be the bio-chemical treatment of waste water. It has been shown that 30 % BOD reduction can be achieved in about 40 km. of sewer line, thereby reducing the load on treatment facilities. Such reactions could be either physical, chemical or bio- chemical or a combination of these. The reactor slurry pipeline must be viewed in the light of an average transportation velocity of 1.5 m/s, or for a distance of 160 km — this represents a retention time of more than 30 hours.

**Magnetic levitation.** One of the major drawbacks to the pneumo capsule freight pipelines is the need for wheeled capsules. The conveying fluid (air) has a density too low to provide and buoyancy effects. The wheels can be considered as the weakest link; being small, they rotate at high speeds and are subjected to high loading. Recently the Knolle Super Pipe concept has been mooted. Essentially, the Knolle Super Pipe has a magnetic suspension system, relying on the repulsion of like poles. The proposed system claims to be able to transport freight like coal and grain, at rates of up to 10 million t/a. Capsule payloads are relatively low for although capacities are high. It is proposed to use linear induction motors (LIM) as the prime mover; however, there could be sound reasons to consider the use of air as prime mover.

**Integral Bahn.** In an attempt to combine all the positive features of existing transportation systems, the Integral Bhan concept has been investigated. This multipurpose transportation system has been designed to carry a wide range of products providing for a multidirectional traffic flow. A large diameter tube is elevated on stilts with a suspended railway on either side. The railway could carry 150 containers, passenger cars and the like. Inside the large diameter tube it would be possible to mount long-distance conveyors, slurry pipelines, gas pipelines, etc. The Integral Bahn does not meet the specifications of the classical freight pipeline, but makes use of some of these systems as well as of some of the obvious advantages of using a pipeline.

**The people pipeline.** To data freight pipeline development has been directed solely towards the transport of a wide variety of freight commodities. However, it is the opinion of the author that the next phase of freight pipeline development must be directed towards the trasport of people. Already there has been a proposal of a pneumo capsule people conveyor to trasport passengers over 20 km in the SelenogorskMoscow route in the USSR. The proposal is for capsules to move at 90 km/h over this distance. It is evident that the numerous advantages which can be obtained from freight pipelines could be used to develop the people pipeline. If the pneumo capsule concept is used, already computer control is providing total route flexibility for in house trasport systems. The system could provide for pollution fr transport with the added advantage of a stationary pri mover.

**Economic Considerations.** As with any other mode transport, there are many factors which will influence the economic viability of freight pipelines. It is thus impossible make a general statement on the relative economic merits these systems as compared with other modes. An analys into the economic viability of a pneumatic coal hoistin system showed that when compared with normal windin system, an overall cost advantage of 3:1 was achieved wi the pneumatic system. The later consumed more power, b the reduction in the number of personnel and the extremel low maintenance cost outweighed the additional power costs. A comprehensive economic study of pneumo capsule pipelines for the conveyance of manufactured products concluded that:

When the annual tonnage was high (25 million tonnes a year and the shipment size was small (5 tonnes), the freight pipeline was cost-wise attractive as compared with other transportation modes for all 'line-haul' distances examined (in the range 160 km— 1,120 km). Even when the shipment size was large (35 tonnes), the frieght pipeline was still cost competitive, particularly for 'line-haul' distances over 500 km.

When the shipment size was small (less that 10 tonnes) the tonne-km cost of the freight pipeline was found to be almost identical with a truck for all '1ine-haul' distances (100 km to 1,120 km).

The cost of slurry pipeline confirmed that the cost per tonne-km of transport of bulk commodities decreased with increased annual volume and transport distance. It is estimated that only 30 % of pipeline costs are affected by inflation, rather than about 60 per cent in the case of a railway system. Further, it has been shown that over a period of 20 years, the operating costs of a pipeline could be half of those of a railway system. It is thus evident that the second phase of freight pipeline development is well on its way. As development become reality. It is clear that the multipurpose nature of these new generation freight pipelines will further enhance the position of frieght pipelines in the transportation industry. As reliability improves, it is predicted that the people pipeline could become an accepted mode of travelling in the not too distant future.

(Excerpts from article by R.D. Marcus of South Africa in "Bulk Solids Handling").

— **T.P.S. RAJAN**

*Readily Available*

DI-ETHYL OXALATE

Contact Manufacturers:

**ORTHO ESTERS**

General Assurance Building, 232, D.N. Road, 3rd Floor, Fort, BOMBAY 400 001.
**Telephone No. 204 5154 and 204 2398**

**Also Offering**

**"PDI" - ACRON PIGMENTS/BINDER/PIDIVYLS/PIDINONS**
*** DYFINISH KVS * DYZOL TF * TEXTILE CHEMICALS / AUXILIARIES**
*** ACETIC ACID GLACIAL 98/99% * 'NPL' HYDROGEN PEROXIDE 50%**

AVAILABLE
EX-STOCK

**PROPYLENE GLYCOL - I.P.**

Please Contact:

**Ganesh Turnkey Projects & Lessors Ltd.**

C-20, Monarch, Shriniwas Bagarka Road, Andheri (E), Bombay - 400 059.
**Phone: 298476**
*Branches:* Delhi & Calcutta

CONSUMERS & EXPORTERS!
For Your Requirements of:

ANALGIN I.P.
CALCIUM GLYCEROPHOSPHATE B.P.C.
MANGANESE GLYCEROPHOSPHATE B.P.C.
MAGNESIUM GLYCEROPHOSPHATE B.P.C.

*ANY BIOLOGICAL PRODUCTS LIKE:*
BACTO-PEPTONE * PEPTONE PASTE
PROT LIVER EXT. POWDER OR PASTE
LIVER CONCENTRATE POWDER OR PASTE
LIVER FRACTION NF1

Please Contact:

**KOTHARI BROTHERS**

8, Vijay Subh Nivas, 2nd Floor, Pandya Lane, Juhu Tara Road, Bombay 400 049. **Phone: 6129890**

# CHEMARENA

**S.L. VENKITESWARAN**

## Better catalyst for polypropylene

Polymerisation of propylene has been revolutionised through continuous improvements of the catalyst system from the original Ziegler-Natta base. The continuous rise in production and usage has been maintained by the radical changes in technology and product diversity through the newer catalysts. Solvent usage has disappeared and removal of metal residuals is no longer required. The liquid bulk and gas phase polymerisation are the norms and IPCL among others had to scrap their 15 year old plant and build a new one. Single lines of 200,00 tonnes are in operation. Gas phase processes are of Union Carbide (Unipol) and BASF while liquid bulk methods suitable for smaller capacity are from the pioneer Himont (successor to the originator Montecatini), Shell, Amoco and the Japanese. Smaller plants mean diversity of grades and use of comonomer with far less off grade products in change-overs. The new high activity catalysts produce 5 to 15 kgm of polymer per gram of catalyst and with less than 1% of atactic polymer. For liquid bulk polymerisation the reaction is in liquid propylene and reportedly in a loop shaped pipe reactor at 60 to 80°C and 35 to 40 bar pressure.

The gas phase process of Union Carbide uses super active catalyst of Shell Chemical Co. in a fluidised bed at 60°C 80°C and 300 to 500 psi. Ethylene can be a comonomer 6 to 8%. BASF have their own gas phase process called Nov olan and use a single reactor with a vertical helical stirre and again at nearly similar temperature/pressure conditions Japan's Sumitomo have a gas phase process and licensed Exxon who operate the largest capacity of the world.

What is important is the catalyst and the technology licenc is linked to the supply of catalyst. When a catalyst is devel oped by the producer himself this necessity is eliminated bu performance has to match the design requirements. Hoechs expects to use its own catalyst in a Himont spheripol plant Hoechst claim that the catalyst can be used in gas or liqui bulk phase. It is claimed that the catalyst is different fro the titanium based catalyst and with perhaps higher activity Himont catalyst is also produced by Mitsui and perhaps highly lucrative operation. Today Himont dominates polypropylene production and also licences who use the technology and the catalyst.

It is to be seen how far the development and supply of catalysts by others will affect the picture in the coming years.

## Polyvinyl alcohol fibre in the news

The fibre from polyvinyl alcohol — Poval — developed by Kuraray three decades back did not find much success and was overwhelmed by polyester. Production has continued to a limited extent in Japan and also in China where Kuraray supplied the technology and plant. More recently polyvinyl alcohol fibre has made a come back as a speciality fibre for reinforcing concrete/ceramic and other items where it can replace asbestos. Japan is reported to use 20,000 tonnes a year and gained an export market to Europe to the extent of 70,000 tonnes. Unitika is another producer of this starting with 3,000 tonnes.

Kuraray have again come up with a fibre from EVA -- Ethylene vinyl alcohol polymer -- under trade name EXE where EVA is used as sheathover a core polyester fibre. This fibre is said to be particularly good for sports wear. EVal is hydrophilic due to the hydroxyl of polyviyl alcohol. The fibre has the same properties as natural fibre like silk or flax. Eval's melting point has been raised to 180°C and Eval and polyester are spun separately and then combined into a single fibre using a gel spinning method. EXE is said to be superior to polyester. Eval to polyester ratio is 45:55 but can be varied. The fibre is said to be glossy with good colorability and very light -- only 1.25 as against 1.39 of polyester.

It is also a good dress material. Though polyvinyl alcohol content may be small there is apparently much scope for it to figure as a fibre material for high priced dress.

# GATT Negotiations continue

The "Uruguay" round of multilateral trade negotiations are reaching the final rounds where decisions have to be taken. There have been four years of talks but not one agreement has been reached (by U.S. at any rate) between the developed and the developing countries. The agreements are due to be reached by December this year. GATT -- General Agreement on Tariffs and Trade -- has always been confronted only with the tariff barriers and non-tariff barriers till recently but US additions of agricultural and services trade, foreign investment and intellectual property rights in the ambit of GATT has raised more problems. There are 15 groups negotiating trade and one group handling services trade.

Chemical Industry of USA dominates international trade in this sector and has always large surpluses of exports over imports and the surplus has zoomed to over 15 billion dollars as of 1989. Chemical Manufacturers Association of USA wants "balanced comprehensive agreements". The critical issues are referred to as TRIPS -- Trade related intellecutal on these properties (protection) and TRIMS -- Trade related investments measures. It is doubtful if there could be compromise by countries like India whose main concern is to have more access to the US market. Subsidies on exports and an dumping codes are also troublesome issues but there are d pute settlement mechanism under GATT.

Non tariff barriers and what is termed equivalent mark access by agreed exchange of tariff concessions on other un lated items is the usual mechanism. But "across the boar concessions of this type on chemicals to secure equivalen on other products are opposed by the CMA. US Trade Re resentative is faced with a stiff task but is advised by o of the top executives of the chemical industry who wants th US should not succumb to political pressure. The CMA wa specific "request - offer" approach with each country. It rather difficult to understand stiff stands of this type (in a country which exported $ 36.5 billion worth of chemic as against $ 20.8 billion imports in 1989.

India may be facing serious difficulties in the wake of earlier threat of "Super 301" being invoked against her the US -- happily withdrawn recently. But India has to some thing to bring down the unconscionable levels of ta on many chemicals at presents.

# Cold Fusion — Continued Controversy

The much-boosted "cold fusion" viz. fusions of atomic nuclei under mild conditions of an electrolyser cell — generates only contradictions and controversies and not any hope for energy generation. There is reportedly growing turmoil in the University of Salt Lake City, Utah, where the results were reported about 2 years back. This Univerisity has set up a Cold Fusion Research Institute with a grant of $ 500,000, from an anonymous donor -- but the grant appears to be from the University's own research funds. Inconvenient or negative data of research work by others in the University led to legal notices by an attorney who is reportedly on the University payroll and who has been retained for pursuing patent rights for the original discovery of Dr. Stanley Pous and Martin Fleischman. The results of a professor of physics of the University has been called into question even though the paper was accepted and published in *Nature*. This threat of legal action instead of a scientific discussion of results by the parties concerned has evoked sharp criticism.

Whatever be the controversies centering round the University, the latest of negative results arises from a nuclear chemist of Texas A & M University which showed that palladium (used as electrodes) samples showed contamination with tritium -- in as many of the 28 samples examined. It is contended that low level tritium contamination of palladium makes the claim of its source as cold nuclear fusion invalid. But again there are also some other results of experime work showing tritium levels much higher than what co arise from contamination.

In India also we have ardent advocates supporting fusion claims. What the National Cold Fusion Institut University of Utah, Salt Lake City, will come up with is known. Much as one would like cold fusion to be a re and open a way towards abundant energy, the prospects certainly not bright.

On the other side, the recognised path to nuclear fu through very high temperatures has led to joint efforts by and the Soviets along with Japan and Western Europ development of the Soviet design of Tokomak -- mag containment of the extremely high temperature. This international effort faces no controversy on the fac nuclear fusion at millions of degrees of celcius. The co oration between the top scientists from the four countr said to be exemplary and the stage is now set for en ering designs.

This does not promise cheap and abundant power for kind without a nuclear mishap but the power generation be a reality even if costs become totally prohibitive unworkable.

For Competitive Imports of Chemicals, Pharmaceutical
Raw Materials and Particularly for the Following Items

**Dioctyl Phthalate**
**Diallyl Phthalate**
**Creatinine**
**N,N Dimethylaniline**
**Sodium Cyanide**
**Potassium Cyanide**
**Cyclohexanone**
**Selenium Metal**

PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

**CHEMET**

HEAD OFFICE:
Taj Building, 1st Floor, P.B.No. 195, 210, Dr. D.N. Road, Bombay: 400 001
Phones: 2043803/4/5/6/7 Fax. No. 2048854
Cable: DEGUCHEM Bombay Telex: 11-3229 11 4631 DGKM IN

CALCUTTA OFFICE:
Sharma House, 3rd Floor, 1/2 Lord Sinha Road, Calcutta-700 071
Phones: 447306 ■ 446155, Cable: DEGUCHEM Calcutta. Telex: 21-33 25 DGKN IN

MADRAS OFFICE:
10, Kondy Chetty Street, 1st Floor, P.B. No. 1709, Madras 600 001 Cable DEGUCHEM, Madras
Phones: 582447 ■ 587617 ■ 580796 Telex 41 7554 DGKM IN

DELHI OFFICE:
214, Hans Bhavan, Wing No. 1, Bahadurshah Zafer Marg, New Delhi - 110 002
Phones: 3311373 ■ 3319787 ■ 3319791 Cable: DEGUCHEM New Delhi,
Telex:31 65921, DGKM IN.

HYDERABAD OFFICE:
905 2, 9th Floor, Babukhan Estate, Basheerbagh, Hyderabad-500 001
Phone : 242318, Telex: 0425 - 2188, DGKM IN.

### ULK DRUG PLANT AT ANKLESHWAR

# Rhone Poulenc surrenders licence

Rhone Poulenc India Ltd. (formerly May & Baker) has surrendered its icence for setting up a new metronidazole bulk drug plant in Ankleshwar. It has also surrendered the land allotted for setting up the new plant.

Company sources say the project is being given up because it is not viable. The real reason, according to industry observers, is the prevailing uncertainty in view of the new government's unwillingness to implement the Drug Prices Control Order (DPCO) 1987, enacted by the previous regime.

Though not many companies openly acknowledge it, the trend is to expand into non-pharmaceutical products as there is uncertainty about the government's intentions on bringing drugs under price control. Several companies have frozen new pharmaceutical projects and are looking at other fields. The trend to diversify into agricultural and industrial chemicals has been accelerated in companies with access to technology.

A handful of companies have told their shareholders that they do not intend to expand their pharmaceutical activities in the prevailing conditions, not always mentioning this reason. E. Merck, for example, has stated that it is not expanding its pharmaceutical business. Abbots has said the same. The company proposes to move to its nutritional product range.

Successful Indian companies like Cadila, Lyka and Lupin already have substantial interests in unrelated fields like machinery, medical equipment, chemicals, healthcare and cosmetics to fall back upon.

Exports are another avenue where companies are focusing attention as exports are governed by relatively stabler policies. Any successive government in the foreseable future will have to continue to encourage exports. Export profits are also free from tax. E.Merck is setting up an export subsidiary. Mr. J.B. Mody's Unique group is setting up an export-oriented unit. German Remedies secured a profit of Rs. 4.5 crores from its wholly-owned export subsidiary. GR Exports.

Thanks to sterling performance by this unit, the company had announced 1:1 bonus. Despite a lacklustre performance on the home front, Hoechst India Ltd. has been doing very well on the export front. This is despite the fact that most of India's pharmaceutical export goes to the unpredictable Soviet market.

Companies feel the government continues to cut prices arbitrarily and refuse to approve of genuine cost increases cleared by BICP on the basis of documentary proof.

-- **Economic Times**

## PLASTICS — HUGE POTENTIAL

Plastics have developed rapidly over the last two decades. More and more conventional materials are being replaced by one or the other plastics. The reason for this change is the unquestionable superiority of these plastics over conventional materials in a number of properties such as light weight, easy process, resistance to corrosion, heat, electricity and availability. The plastic family is divided into commodity plastics and engineering plastics.

Although commodity plastics are capturing most of the fields, there are some specialised areas like defence, industrial applications, automobiles, aerospace, electrical, electronics etc. where more load bearing and strength properties are required which normal commodity plastics cannot provide.

The plastics industry in India has undergone a sea change in the la decade. There has been a substantia increase in demand for consumer dur ables like TVs, washing machines computers and automobiles.

In the next five years, India will b producing additional 1.2 million tonne of polymers. The demand on th engineering industry, to produc machinery, equipment, moulds and die is likely to be colossal

The consumption of various polym ers, including thermoplastics, thermo sets, performance plastics and other was around 6.9 lakh tonnes in 1988-8 which is expected to go up to aroun 8 lakh tonnes in 1989-90.

By the turn of the century, it i expected to be 27.59 lakh tonnes wit an average growth rate of 11 to 12 pe cent per annum. The compound annu rate of growth in consumption of com modity polymers during the sevent plan period was around 11 per cent. Th overall growth rate in the Eighth Pla period is expected to go up to 15 p cent.

## GULF CRISIS HITS SUPPLIES T HALDIA REFINERY

The Gulf crisis had affected th Indian Oil Corporation's Haldia refi ery in West Bengal disrupting th normal flow of crude oil supplies.

Indian Oil sources, said the refinery crude stocks, including the shipments the pipeline would keep it going f 24 days against the average of 40 day The refinery needs 8000 tonnes of cru a day for its throughput but it is mana ing with about 7,500 tonnes a day.

It is based on supplies from Ira Kuwait and the United Arab Emirate with bulk of them coming from Iraq a Kuwait. The design factor for proce sing the crude limits the refinery options in exploring alternative sourc of supplies.

For your import requirements of

**Acetone**
**Hydroxylamine Sulphate**
**Pyridine Pure**
**Sodium Metal**
**3,4,5-TMBA**
**Isopropyl Alcohol**

For further details, please contact:

# PRIYA CHEMICALS

HEAD OFFICE:
Podar Chambers, 4th Floor, S.A. Brelvi Street, Bombay 400 001
Phones: 2860596 ■ 2863611 ■ 2863676 ■ 2863783 ■ 2863900
Telex: 0118-5495 PRIA IN ■ 0118-6556 PRIA IN ■ 0118-2472 PODR IN

BRANCHES

— HYDERABAD OFFICE —
Prashanthi Commercial Complex, 6-9-30/6 to 8/B, 2nd Floor, Basheerbagh,
Hyderabad - 500 029 Phone: 236068

— DELHI OFFICE —
Flat No. 8, 10th Floor, Akash Deep Bldg., Barakhamba Road, New Delhi 110 001
Phones: 3314512 ■ 3310413

— BANGALORE OFFICE —
Devatha Plaza, 131/132, Residency Road, Bangalore 560 025 Phone: 214027

— MADRAS OFFICE —
5-J Century Plaza, 560-562 Mount Road, Teynampet, Madras 600 018
Phone: 451597 ■ 451031 Telex: 041-8809 PRIA IN

— CALCUTTA OFFICE —
"LORDS", 3rd Floor, 7/1, Lord Sinha Road, Calcutta 700 071
Phone: 222378 ■ 222379 ■ 228015 ■ 226367 ■ 300765

BATTERY TECHNOLOGY

# Silent revolution on

The Technology Advance Centre (TAC) held a three-day symposium on 'Advances in Electrochemical Power Sources' at Madras from 29th August to 31st August. Prof. S.K. Rangarajan, Director, Central Electrochemical Research Institute, gave a special address on "Electrochemical Power Sources", wherein he spoke on battery cell development.

Earlier, welcoming the the gathering, Dr. K.S. Rajagopalan, Executive Vice-President TAC said:

"Electrochemical power sources have developed very gradually over the last 200 years. In the last 30 to 40 years, this development has received a big push starting with water-activated Mg-AgCl and Mg-CuCl cells. Several types of lithium cells are coming out of the laboratories. Storage batteries such as Ni-Zn, Ni-hydrogen, Zn-chlorine, zinc-bromine, sodium-sulphur, lithium-sulphide are being experimented upon. The reason for this push is obvious. Electrical energy from fossil fuel has to give place to electrical energy from nuclear energy, solar energy, ocean thermal energy, geothermal energy, wind energy and tidal energy. When this happens, electrical energy cannot be generated only when one wants it and shut off when one does not want it. Electrical loads from non-conventional energy sources have to be stored on a vast scale and use of storage batteries on the same vast scale will come inevitable.

The world has entered the electronic age during this century and electronic equipments are getting miniaturised through integrated circuits, large integrated circuits and very large integrated circuits. A dire need has arisen to produce electrochemical power sources also on a miniaturised scale. This symposium will deal with the micropower sources as well as the macropower sources.

I cannot think of a more appropriate person than Shri T.V. Venkataraman to inaugurate this symposium, because he heads the energy agency of this state. He belongs to the Indian Administrative Service and has held a variety of high positions but this engagement with energy may be more intriguing than the other assignments. Dr. Ved Mitra represents the funding agency in this country for non-conventional energy sources. The more oil becomes scarce, the more this department will grow.

Shri Jayaraman is running a very big plant for high energy batteries and he is releasing the proceedings. I consider the acceptance of our invitation to give a special address by Professor Rangarajan as a fitting recognition of the challenges which electrochemical power sources pose. He is known in scientific circles all over the world for this readiness to accept challenging tasks and that too in the very fundamentals of a subject. I welcome all these distinguished people in the head table for their respective roles in the inaugural function."

Shri T.V. Venkataraman, I.A.S., inaugurated the seminar. He observed that research in electrochemical power sources must be translated into a commercial activity, within a specific time span. Research had thus to be goal-oriented.

Prof. S.K. Rangarajan in his special address said that battery systems are a hundred years old, and battery technology has initially been innovative having been developed by non-technical persons. But today we are on the threshold of a tremendous development in the battery industry. There is no dearth of problems to work upon. A silent revolution is taking place in the battery industry.

Talking of futuristic trends he observed fuel cell technology had a positive role to play. But the developm
of fuel cells as a commercial propo
tion would take at least fifty yea
There was also considerable devel
ment in batteries for electric vehicles
companies like General Motors, Chr
ler and Ford.

Battery technology had to be sen
tive to materials technology devel
ment for the latter had a direct imp
on evolution of new types of batteri
The vote of thanks was read out by S
J. Guruswami, Hon. Secretary, TA
The inaugural session was followed
technical sessions spanning three da

---

## FRESH STEPS FOR OIL SUPPLIES

The Government has arranged
additional supplies of crude oil fr
Iran, Saudi Arabia, Malaysia a
Indonesia to meet the situation caus
by disruption in supply of crude oil a
petroleum products from Kuwait, I
and USSR following the Gulf crisi

A delegation is currently in USSR
discuss matters relating to uninterrup
supplies of crude oil from that count
A delegation has also left for UAE a
Bahrain for tying up supplies of cru
and petroleum products from th
countries.

Additional supplies have been arra
ged from Iran and Saudi Arabia throu
spot purchases, the release said. T
Cabinet committee on oil managem
met at New Delhi on Aug. 29 to revi
the steps taken to meet the disrupt
in the supply of crude oil and petrole
These efforts, the release said, w
expected to lead to uninterrupted fl
of crude oil and petroleum products
satisfactory inventory holdings.

Meanwhile the Petroleum and Che
icals Minister, Mr. M.S. Gurupad
wamy, assured the Lok Sabha
making all efforts to import crude
meet the growing demand for petrole
products.

# ICICI, associates to fund Reliance expansion

The Industrial Credit and Investment rporation of India and its associated titutions will finance Reliance's pansion of its partially-oriented yarn int, the 'modernisation and upgrada- n' of its textiles and petrochemicals vision, and its purchase of ships.

The financial institutions are expected make available around Rs. 1,500 ores towards the various projects of s group over the next two years. ICI will provide a co-acceptance limit der its deferred credit scheme of . 100 crores for the borrowings of eliance Industries Ltd.

The ostensible purpose of the borrow- g is the modernisation, technical gradation and replacement of obsolete uipment at the petrochemicals divi- on and the Naroda technical division.

The Shipping Credit and Investment rporation of India, which is also aded by the ICICI Chairman, Mr. N. ghul, will provide Rs. 71.88 crores r Reliance's purchase of three new hterage tankers.

These ships will have a dead-weight 3000 to 5000 tonnes each, and trans- rt ethylene gas, meeting the Reliance oup's requirement for the next four ars.

ICICI's foreign exchange loan will nount to Rs. 53.91 crores, and its loan Indian Rupees, to Rs. 17.97 crores. ie Reliance contribution would nount Rs. 23.37 crores. The Govern- ent cleared this purchase on June 26, 90.

ICICI has also agreed to lend $7.8 llion for the import of capital goods. is is apparently necessary for the odification of the PSF plant to include POY manufacturing facility.

This modification has been described as 'broadbanding', a term now robbed of any original meaning. Eventually, broadbanding may permit Reliance to make virtually any product it can manufacture from naphtha.

ICICI has also agreed to Reliance's sale and lease back' of its assets at Patalganga. This will provide the company another Rs. 82.35 crores.

Other loans approved by the consortium led by ICICI include Rs. 84.3 crores for the repair of the Patalganga plant, consequent on last year's floods, Rs. 80-odd crores for Reliance's so-called PTA standby capacity, really a full-fledged PTA plant, Rs. 30 crores for the Chembur Patalganga pipeline for a Reliance front company and about Rs. 550 crores for Reliance's Rs. 832 crore gas cracker. And ICICI, at its very highest level, has assured the Ambanis that it will provide Rs. 265.5 crores to build another PTA (purified terephthalic acid) factory Rs. 51.75 crores for a (LAB) linear alkyl benzene capacity expansion, Rs. 53.75 crores for Reliance's expansion of its PSF (polyester staple fibre) plant and another Rs. 200 crores for RPL's expansion of its MEG (mono ethylene glycol) facility to be constructed at Hazira, by 20,000 tonnes.

## RAPICUT CARBIDES

Rapicut Carbides Limited, is engaged in the manufacture of tungsten and tungesten carbide products at Ankleshwar, Gujarat.

For the year ended 31st March 1990, the company had declared a dividend of 30 per cent, of which 15 per cent, has already been paid as interim dividend. The dividend now declared is on the ex-bonus capital and works out to 60 per cent dividend on the pre bonus capital.

**For the most competitive CIF price of**

**ACRYLAMIDE**

**Please Contact:**

**Mr. DHAIRESH K. SANGHVI**

**M/s. KANTILAL SANGHVI & CO.**

3rd Floor, Union Co-operative Insurance Bldg.,
23, Sir Pherozeshah Mehta Road,
BOMBAY 400 001.
**Phones: (Office): 2870836/2873217/2873628**
**(Resl.): 4226850/4229086**
**Telex: 1185725 EXIM IM** **Gram: EXPIM, Bombay**
**Fax: (22) 2874153**

# Iodised salt production to be stepped up

Tamil Nadu has the potential to make more iodised salt and so the 22 iodised salt producing units in the State have been asked to increase output, according to Mr. E.K. Sharma, Salt Commissioner, Government of India.

The annual production of the 22 units was only 50,000 tonnes against the capacity of 2.4 lakh tonnes, Mr. Sharma told presspersons on 29th at Madras. In 1989, their production was 48,000 tonnes and the all-India production 13.11 lakh tonnes.

The need to increase iodised salt production arose following the Centre's directive under its National Goitre Control Programme envisaging total iodisation of edible salt by 1992.

Most of the goitre endemic States, such as Madhya Pradesh, Uttar Pradesh, Bihar, and the north Eastern States, had now banned sale of common salt for edible purpose.

Dismissing controveries over toxic side effects of iodised salt consumption, he said the product was "perfectly suited for use, as the level of iodine added to the salt is well within the prescribed safety standards''. On the higher cost of iodised salt, he said any good quality salt would cost more than common salt.

Tamil Nadu, with an annual production of 18 lakh tonnes of common salt, was next only to Gujarat and the State catered to the edible and industrial needs of Kerala, Karnataka, Andhra Pradesh, and Pondicherry, besides part of the needs of Orissa, Bihar, West Bengal, and Assam.

Tamil Nadu exported 70,000 tonnes of salt through Tuticorin Port, against the total national salt exports of 1.69 lakh tonnes.

Mr. Sharma, who is at Madras to attend the meeting of the Tamil Nadu Regional Advisory Board for Salt, said the Board would take up development works to the tune of Rs. 50 lakhs this year at salt producing centres in the State. These included laying of roads, construction of storage sheds and also hospitals for workers.

This year cataract operations would be performed on the salt labourers, besides routine health checks to detect toxification from working in the salt fields.

The coastal areas, the primary salt production centres, had been affected by cyclones this year and production had come down. But there was no cause for alarm as the existing stocks could meet the demand.

At the same time, there was no roc for complacency as importing salt (it came to that) would demand a lot fro the national exchequer, Mr. Shar added.

## DOXYCYCLINE PRICE CUT

Government has cut price of dox cycline, a drug mainly produced Ranbaxy Laboratories, from Rs. 5,4 per kg. to Rs. 4,968 per kg.

The cut is on an interim basis Bureau of Industrial Costs and Pric (BICP) is in the midst of a fresh c study. The drug is in category 2 a considered an essential item.

Despite recent Government assura ces, price reductions are being effect which could force some units to suspe production.

Technically, the Government ca force a unit to produce a drug under t Essential Commodities Act but th would be an abnormal situation.

Ranbaxy produced 9.72 tonnes 1986-87. This went up to 17.94 tonn in 1987-88 and is placed at 9.25 tonn for 1988-89.

It exports the drug to the USA, whi incidentally was pioneered by Pfizer, t US drug multinational.

"34TH YEAR OF SERVICE"
A RELIABLE & DEPENDABLE HOUSE FOR CHEMICALS & SOLVENTS PARTICULARLY FOR

CAUSTIC SODA LYE
(In Tanker Loads)

Consumers Kindly Contact
PURCHASE & SALES EXCHANGE
345, Samuel Street, Bombay 400 003.
Telephones: 327129/341105/6887582
Tlx.: 011-74476 ATTN.: 0398 Fax: 287-1441 ATTN.: 0398
011-74498 ATTN.: 0398 287-2220 ATTN.: 0398
ESTD.: 1955
Associates: TEJ ENTERPRISES

FOR YOUR IMPORTS AT COMPETITIVE CIF PRICES

Iodine Crude
2,6-Xylidine
Dimethyl Formamide
Alkyl Benzene Hard
Lactose BP/USP (Ex NCZ)
Propylene Glycol (Ex ARCO)
L-Lysine Mono HCl
Ortho Chloro Benzaldehyde
Beta Naphthol
Stannic Chloride Anhydrous
Dimethyl Sulphoxide
N,N-Dimethyl Aniline
Piperazine Anhydrous
Mancozeb Tech.
3,4,5 Trimethoxy Benzaldehyde
Gallic Acid
Cyclopropylamine
Dimethyl Carbonate
2-Chloro Propionic Acid
2-Chloro Methyl Propionate
Sodium Bichromate
Glyoxyllic Acid
Tartaric Acid
Nitromethane
Methyl Chloro Formate
Triphenyl Phosphite
Thiophenol
Triethyl Phosphite
Mono Methyl Aceto Acetamide
Dicyclohexylamine
Picramic Acid
Methyl Ethyl Ketone
Aniline Oil
Guaiacol
Mono Sodium Glutamate
Epichlorohydrine
Ethyl Mercaptan
Methane Sulphonyl Chloride
Methane Sulphonic Acid 70%
Sodium Picramate

m-Chloro Succinamide

Please Contact for further details:

**S. AMIT & CO.**

A TRUSTED NAME FOR IMPORT OF YOUR CHEMICALS
105, Neelam Centre, "A" Wing, Hind Cycle Road,
Worli, Bombay 400 025.
Phones: 4934627-28/4933310
Cable: "DULICTOL"
Telex: 011-76877 CMIT IN
011-74486 AMIT IN
Fax No.: 22-4949504
Madras Office: Queens Court, 134, Montieth Road, Madras 600 008
Phones: 860172/866942 Telex No.: 041-6459 KNPM IN
Hyderabad Office: 8-3-215/7 (First Floor), Srinivasa Nagar Colony (West)
HYDERABAD-500 890
Phone: 35110

Our Associates: M/s. CHEM AMIT

# Drug companies turn to exports to get around control

Pharmaceutical firms are adopting a twin strategy to beat price control. Not only are they planning to produce more drugs that are outside control but also laying greater emphasis on exports to avoid being caught in the net of government control.

Producing drugs which fall under control is turning unviable with shrinking margins. Drugs units are finding it much more profitable to concentrate on exports where there is no ceiling on price, and profits from exports are exempt from income-tax.

J.B. Chemicals and Pharmaceuticals Ltd. is planning to manufacture special formulation for healing wounds, actovegine. Actovegine is a biological product made from actovegine concentrate. Later it plans to increase production of actovegine for export to Africa and the USSR. The company will conduct clinical trials shortly prior to test-marketing actovegine, which is not subject to price control. The company has entered into a technical collaboration with an Austrian company, Hafslund Nycomed, which developed the formulation for manufacturing the drug.

Mr. J.B. Mody, chairman and managing director of the company, said it would, however, take at least a year before the product is marketed in the country. Exports of J.B. Chemicals shot up to Rs. 15.80 crore for the nine-month period ended March, 1990, from a mere Rs. 1.47 crore in the previous year. J. B. Chemicals has already landed big export orders worth Rs. 16.94 crore for the current year.

Against an increase of 22.74 per cent in sales to Rs. 42.68 crore for the nine months ended March 1990, after-t profits trebled to Rs. 3.98 crore. T company has increased the capacity glyoxal, a category III drug, to 1,5 tonnes a year from 1,200 at its An leshwar plant. Trial production declofenac sodium at Ankleshwar al commenced in March this year. Sign icantly, all these are outside the purvie of control.

A reliable source of supply for

- * High Exhaust Reactive Dyes
- * Vinyl Sulphone Based Reactive Dyes
- * Cold & Hot Brand Reactive Dyes

Current Additions

CCI Reactive Red HE3B
CCI Reactive Orange HER

Contact Manufacturer

COLOUR & CHEMICAL INDUSTRIES

**Office:** 44, Gaya Bldg., 4th Floor,
109, Yusuf Meharali Road,
Bombay 400 003.
**Phone: Off.: 345581, 341545**
**Res.: 6720195**
**Telex: 11 71227 CCI IN**

* WANTED AGENTS THROUGHOUT THE COUNTRY

## NEW TECHNOLOGY PAINTS FROM SHALIMAR

Shalimar Paints, under the new ma agement of Jindal and Junjhunwa group (J & J), has strengthened its ma ufacturing facilities at Howrah. Pla are now afoot to have a second ma ufacturing unit in Maharashtra whe new technology paints such as coil coa ings, powder coatings and polyurethar coatings, besides other decorative ar non-decorative paints will be manufa tured.

This was announced by the comp ny's president Mr. P.K. Basu, at a pre conference in Bangalore recently connection with the launching of Sha imar's new range of acrylic distempe

He said a memorandum of unde standing had been signed with a lea ing Italian paint manufacturer for t technology of making coil coatings a other industrial coatings.

## GUJARAT INJECT

Gujarat Inject Ltd. (GIL), special ing in the manufacture of IV fluids, diversifying into the manufacture speciality pharmaceuticals in technic collaboration with a US firm involvi an outlay of Rs. 7.5 crores.

A new company is being promot for implementing the project which w manufacture import substitute enzym and speciality formulations. The n outfit will enter the capital mar shortly to raise funds for part-finar the project.

### EQUEL TO ILLEGAL IMPORTS AT LOW PRICES

# Penicillin units shy away from market

Several established companies have oved out of the Rs. 200-crore enicillin-based broad spectrum bulk ıti-biotic drugs market, as the country flooded by illegally imported drugs low prices.

The drugs are ampicillin and amox- cillin and the companies that have opped out of the market include Ran- ıxy, Lyka Labs, Concorde (owned by oechst), Pharmachem, Nirlac Chem- als and Arbindo Pharma. According some of these companies, there are everal fly-by-night operators, who nport these drugs on the condition that ese would be re-exported. But when comes to re-exporting these drugs, ey express their inability to do so. As result, these drugs are sold in the omestic market.

Essentially, these operators take dvantage of the present import-export olicy and the huge differential between e international and domestic prices of enicillin (which is the basic raw mater- l for amplicillin and amoxycillin). ıdigenous prices of these drugs are pproximately 2.8 times those of inter- ational prices.

Under the import policy, duty-free nports of penicillin are allowed if they e against export orders. For most of e operators, procuring export orders e not difficult. And after duty-free im- orts are made, the exporter conveni- ıtly declares his inability to execute the xport order. The authorities are, under e circumstances, allowed to charge a enal duty on top of the regular duty. ıterestingly enough, the import duty on enicillin is nil and the penal duty is sually not high enough to equalise omestic and international prices.

Besides exploiting loopholes in the ıw, disguised exports are also taking lace. Talcum powder is reported to be xported in lieu of antibiotics and ioney is transferred back through the avala network. In return, the operators ell duty-free penicillin in the domestic ıarket at higher prices which more than make up for the effort put in on the export front.

According to industry sources, the result of all this is that established manufactures are today priced almost completely out of the market. As against the government notified price of ampicillin and amoxycillin at Rs. 1,925 and Rs. 2,240 per kg, the ruling market price is 25 per cent cheaper, at Rs. 1,475 and Rs. 1,800 respectively. What is more, the government prices have not been revised for the last two years. The differential would be much higher if the recent eight per cent hike in penicillin prices is also taken into account.

The government however, has a point in not revising prices because the ruling market prices are lower than the notified price. The two public sector penicillin manufacturers, Indian Drugs and Pharmaceuticals Ltd., (IDPL) and Hindustan Antibiotics Ltd. (HAL) are also in the receiving end — both of them are repor ted to be carrying large unsold stocks

The amount of penicillin sold in the Indian market by the operators is anybody's guess. Some estimates put the figure at between 20 and 25 per cent of the total demand. Even if the quantum is lower than these figure, the fact that the selling price is lower, tends to depress prices across-the-board.

---

## GAS SUPPLY FOR PIPAPAV UNIT

The Centre has agreed in principle to allot gas to the proposed gas based power station at Pipavav and also for the development of Pipavav and Saurashtra as a whole, the Gujarat chief minister, Mr. Chimanbhai Patel, said. While speaking at a meeting of the Saurashtra Chamber of Commerce and Industry, Mr. Patel pointed out that coal based power station in the region, which remained industrially backward due to lack of electricity and water, was absolutely unfeasible because of its high cost.

FOR MOST COMPETITIVE CIF OFFERS FOR:

**Perchloroethylene**
**Bon Acid**
**Sodium Hydrosulphite**
**and other Chemicals**

Please Contact:

**M/s. K. SANGHVI & CO.**

308, 'Gulab' 3rd Floor,
237, P.D 'Mello Road,
Bombay 400 001.

**Phone: Office: 2612232/2610711 Resl: 8128473/8226451**
**Telegram: KEYSANGHVI Telex: 11-73516 KSC IN**
**Fax No.: (22) 2618970**

# Drug cos. seek more say in DPCO review panel

The pharmaceutical industry and trade have demanded representation in the standing committee, constituted in February 1990, by the department of chemicals and petrochemicals to review the Drugs (Price Control) Order (DPCO).

Members of the joint council of the industry and trade, at its meeting at Calcutta recently, took stock of the latest situation and concluded that with only government nominees in the standing committee and in the three expert groups under it, the views of the pharmaceutical industry and trade would be ignored. They view the presence of the two public sector drug companies, IDPL and HAL, in the expert group on turnover and production issues, is of little consequence.

Mr. Kishor R. Shah, general secretary of All India Organisation of Chemists and Druggists, and the chairman of the joint council, Mr. Anant R. Thakore, general secretary of Indian Drug Manufacturers' Association, Dr. S. Agarwala and Mr. P. Gupta, president and vice-president respectively of Organisation of Pharmaceutical Producers of India, told **Business Standard** that the centre should also set up a separate committee to look into the issue of the drug price equalisation account (DPEA).

Clarifying that the joint council was set up not to exert undue pressure on the government, but to seek reasonable return on investment and reasonable trade margins, the members said their decision to postpone the trade and industry bandh could be reversed if the centre persisted with its arbitrary style of functioning in the matter of price control of medicines.

However, the joint council is still optimistic that the promises made by the Union Minister of chemicals and petroleum, Mr. M.S. Gurupadaswamy, would be fulfilled. The minister had assured the joint council members that no change in the drug policy would be undertaken and no further drugs would be brought under price control before the standing committee completed its review. The minister had also promised to go into the legality of the DPEA.

Questioning the rationale of an expanded net of price-controlled drugs, the joint council members pointed out that the government machinery is not sufficiently equipped to fix prices of more than 15 bulk drugs annually, as against the requirement of determining prices of 175 drugs.

In this context, the decision to bring under price control 21 new drugs in February and five more in July this year could hardly be justified. These measures have pushed up the number of price controlled drugs from 127 at the end last year to 153 at present. Apart from delay in having prices fixed, the margins for the industry and trade are reduced, he regretted.

Refuting the argument that prices of medicines are going up, the joint council maintains that after new DPCO came into force in August 1987, the increase in the controlled category has been 5.7 per cent and in the decontrolled category 7.7 per cent. Both figures are lower than the annual inflation figure, which reached 8.5 per cent in July this year. Moreover, 52 per cent of the formulation prices have either gone down or have not increased at all after the DPCO was enforced.

If gradual deregulation was brought about in the drug industry, market forces would have pushed down prices anyway. Instead, the government has stuck to its decision to control more and more drugs.

Nothing that only 22.66 per cent and 15.11 per cent of the total medical treatment costs pertain to medicines in regard to home and institutional care respectively, the joint council feel that over-emphasis on price control of drugs is wholly misplaced. This is all the more in the context of overall escalation of costs in the economy.

The joint council members belie
that these figures would convince
concerned that more and more regul
tions in the drug industry can be intr
duced only at the cost of quality a
availability of drugs.

---

## DUAL PRICING OF PETROL RULED OUT

At present, the government has
proposal to adopt dual price system f
petrol and diesel, the Petroleum Mini
ter, Mr. M.S. Gurupadaswamy inform
the Lok Sabha on August 28. The rece
developments in the Gulf region a
expected to result in considera
increase in the import bill for crude a
petroleum products.

The Petroleum Minister, Mr. M.
Gurupadaswamy said the developme
have affected the supplies of crude
and have led to increase in the price
The demand for petroleum products th
year is estimated at 58.87 million tonn
and the indigenous production is es
mated at 35.9 million tonnes, Mr. Gur
padaswamy, added.

**Cost of oil blockade**

There was a loss of production
about 99,000 tonnes of crude due to va
ious bandhs and barricades in Assa
from April to August 21 this year. T
Petroleum Minister, said it was not po
sible to specify how much of this lo
was due to the activities of ULFA.

---

## TRADE SHOW ON TECHNOLOGY

A unique specialised trade show
technology and services for the finan
industry called, "Technobank 90"
scheduled to be held from September
to October 2 at New Delhi.

The exhibition will be inaugurated
the Union Minister for Finance, Pr
Madhu Dandavate, and will have pa
ticipants displaying data processi
equipment, software, information sy
tems, telecommunications and financ
printing. The exhibition has been org
nised by the Modern Exhibition Liais
Associates (MELA).

SC

**Star Chemicals**

FOR YOUR IMPORT REQUIREMENTS OF

**Acetyl Chloride**
**2 Amino Thiophenol**
**Creatinine**
**3-Cyano Pyridine**
**4-Cyano Pyridine**
**Dimethyl Formamide**
**Hydrazine Hydrate 80%**
**Iodine Crude**
**Metacresol 99%**
**Potassium Ferrocyanide**
**Para Tertiary Butyl Phenol**
**Para Tertiary Octyl Phenol**

**Pyridine Pure 2°**

And for other Chemicals, Pharmaceuticals & Intermediates

PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

MADRAS OFFICE:
D-4, 2/36 RAMS SQUARE
2, Village Road
MADRAS 600 034
Tel: 864430/8250097
**Tlx: 041 25164 STAR IN**
**FAX: 044 473762**

HYDERABAD OFFICE:
'NALANDA' Unit No. 7
6-3-649, Somajiguda
Hyderabad 500 482
Tel: 210288
**TLX: 0425-6131 STAR IN**

OUR LOCATION DOES NOT MAKE ANY DIFFERENCE TO OUR COMMITMENT TO SERVE YOU

# Lyka writ against DPEA demand

Lyka Labs has filed a writ petition in ne Delhi high court against the department of chemicals and petrochemicals or the latter's attempt to recover Rs. 6.78 crore as unauthorised profit llegedly made by the former on an nti-fungal drug.

Lyka was one of the few lucky companies to have not received a follow-up notice for depositing unintended profits till recently as the file concerning its case had mysteriously disappeared from the department. The government has already ordered a CBI enquiry into the missing file.

In the meanwhile, a drug cost accounting expert, who rejoined the department a few months back, recreated the file and reckoned Lyka's liability at Rs. 6.78 crore. Lyka is required to deposit this amount in drug prices equalisation account as unauthorised profit made on flucinolone acetamide from 1979-80 till the repeal of drug prices control order 1979, on August 25, 1987.

The department had originally issued a notice to Lyka in 1984 for making unintended profits. It served a follow-up notice on April 18, 1990 asking Lyka to furnish the details regarding the bulk drug as well its formulations.

Following expiry of the deadline for submission on details by May 10, the department sent another reminder threatning penal proceedings against the company for not furnishing the requisite information. Lyka, later, submitted some information but recently filed a writ petition in the Delhi high court. According to the department, the prices of fulcort range of formulations made from flucinolone acetamide were fixed in June 1984 under DPCO, 1979.

"Prima facie, the prices as fixed by the government were not complied with by the company under the plea that flucort range of formulations are not price controlled".

Following the inclusion of this bulk drug in category II of DPCO, 1987 at the directive of the Union minister for petroleum and chemicals, Mr. M.S. Gurupadaswamy, the department fixed the formulations prices on March 9, 1990. Lyka has told the department that it immediately implemented statutory prices after receipt of price fixation order.

---

## GLAXO TO BRING OUT NEW DRUG

Glaxo Laboratories plan to introduce a new bronchodilator drug in the country, Salmetrol, which it claims will dilate the air-passages of patients with bronchial ailments for a period of hours. Remedies currently in use provide patients relief for far shorter durations.

The drug will first be introduced in the U.K. and will become available in India after field trials are complete. Glaxo officials feel the new drug will capture a large segment of the bronchodilator market presently dominated by "Asthalin", a drug produced by CIPLA Laboratories.

The officials are confident that the drug will be a winner as none of the other brands in the market, including their own salbutamol based drug "Ventorlin" can dilate an asthmatic patient's air passages for 12 hours. Chest specialists in Bombay when asked for their opinion on the drug said it would have to be tried out before they could comment on its efficacy.

According to Dr. P.V. Niphadkar, secretary of the Asthma and Bronchitis Association of India, none of the drugs currently available can dilate a persons' air-passages constricted during an asthmatic attack for more than six to seven hours.

A drug which gives relief for up to 12 hours will be welcome. He however cautioned that the relief time varies fron person to person. Drugs which giv some patients relief for 12 hours, migh only provide an eight-hour relief t others. It might not even succeed i some cases. There is no standard treat ment for asthma patients", he opined

Dr. Niphadkar said there are abou 2.5 crore asthmatic patients in India though he warned that the statistics may not be accurate. Glaxo officials put th total number of patients suffering fron asthma as well as other bronchial ailments at approximately 5 per cent of the total population, Dr. Niphadkar agree with this figure.

The market for bronchodilators i increasing in India as well as worldwide. Increasing pollution, changin food habits and the current high level of stress in the urban environment have caused a steep rise in the number o patients suffering from asthma and othe bronchial disorders, Dr. Niphadka explains.

Sales in India are expected to be goo according to company officials, wh claim that Salmetrol has a potentia global market of 25 million patients an will notch up an estimated $ 500 million in annual sales. Glaxo Holdings, the international company, has global sale pegged at $ 4.4 billion.

---

## SIP RESINS

SIP Resins is in the red during th year ended March, 1990 with a gros loss of Rs. 31.05 lakhs against a gros profit of Rs. 48.24 lakhs for 11 month despite an increase in turnover t Rs. 819.03 lakhs from Rs. 641.93 lakh

At the net level, there is a loss o Rs. 43.66 lakhs against a profit o Rs. 33.12 lakhs after depreciatio (Rs. 12.61 lakhs against Rs. 10.2 lakhs) and taxation (nil against Rs. 4.8 lakhs). The dividend is being skippe against 16.5 per cent.

For **IMPORT** of following Products

**(ASC) N-Acetyl Sulphanilyl Chloride (Japan)**

(Important High quality intermediate for Sulpha Drugs & Vinyl Sulphone.
Also to avoid use of Chlorosulphonic Acid and pollution problem)

**Isobutyl Benzene**
**2,6-Dichloroaniline**
**L-Lysine Feed & Pharma Grade**
**DL-Methionine Feed Grade**
**Various other Amino Acids**
**Epichlorohydrin**
**Cellosolve/Carbitol**
**Furfuryl Alcohol**
**Beta Naphthol**
**Beta Picoline**
**3-Cyanopyridine**
**Perchloroethylene**
**Ethoxylated Nonyl Phenol 9.5 Mol (Emulsifier)**
**N,N-Dimethylaniline**
**Dimethyl Formamide**
**Diethyl Sulphate**
**Cyclohexanone**
**Ethylene Dichloride**
**Phenol**
**TDI/MDI**
**Naphthalene Crude**
**Iodine Crude (Japan)**
**Propylene Glycol**
**Acrylamide**
**Thiourea**
**Pyridine Pure**
**Guanyl Thiourea**
**Morpholine**
**Microcrystalline Wax**
**Thioglycollic Acid**
**Gamma Picoline**
**4-Cyanopyridine**
**Meta Nitro Acetophenone**
**Ortho Anisidine**
**2-Chloro Propionic Acid**
**2-Ethyl Hexanoic Acid**
**N,N-Diethylaniline**
**Para Chloro Benzoic Acid**
**Ethyl Cyano Acetate**
**Ortho Chloro Aniline**
**Trimethylol Propane**
**Polyol**

and various other industrial chemicals/intermediates/fine chemicals pharmaceuticals etc.

Please Contact the Indenting Agent:

PACIFIC

**M/s. PACIFIC AGENCIES**

41, Prospect Chambers Annexe, 3rd Floor, 317, Dr. D.N. Road, Bombay 400 001.
Telephone: Office: 2044482/244923/232833
Residence: Mr. Lathi 5113387 Mr. Vyas 5121909
Telex: 011-86799 PCFC IN

# Rs. 2.63 Cr. KAPL modernisation plan

Karnataka Antibiotics and Pharmaceuticals Ltd., (KAPL), a state undertak-ng, has ended the year 1989-90 on a satisfactory note to launch a Rs. 2.63 crore modernisation-cum-expansion to facilitate commercial production of animal birth control injections, for the first time in the country. The company continued its track record of posting profits from the very first year of operations to net a pre-tax profit of Rs. 13 lakh for the year ended March 1990. Mr. B.N. Betkerur, chairman, and Mr. M. Madappa, managing director said.

Talking to newsmen, Mr. Madappa said the company's production touched a new high of Rs. 19.57 crore against Rs. 16.25 crore last year. The sales turnover stood at Rs. 15.13 crore and a pre-tax profit of Rs. 13 lakh was achieved. The company has already obtained necessary clearances and large scale validation by the Drugs Controller of India for launching the mass production of animal birth control injections. Mr. Madappa said this was for the first time an Indian company has achieved such a feat and said an additional investment of Rs. 61 lakh has already been made to facilitate commercial production of talsur range of animal birth control injections.

The central government and Karnataka state have already approved KAPL's plans to go in for a modernisation-cum-expansion plan of the company costing Rs. 1.5 crore. He said the expansion of the existing facility was a must since the market share of the company is growing fast and new products have been introduced to meet the demand. During the year ended March 1990, the company achieved an exports income of Rs. 99 lakh against Rs. 16.80 lakh during the previous year.

Mr. Madappa said the company products have been getting good response in UK, West Germany, Belgium like advanced countries and Afghanistan, Bangladesh and other developing countries. The entire exports earnings was in hard currency and the company proposes to increase its exports to be at around 20 to 25 per cent of its turnover in the near future.

Since the Union government has banned public sector units from undertaking loan licencing arrangements, Mr. Betkerur said, the company suffered. Normally around 15 per cent of the capacity of the company used to be devoted for loan licencing, he added.

In spite of the ban the company could able to post profits and to maintain this unique feature the KAPL management has started importing and marketing aid kits in the country. With the continued emphasis on animal health care products and the new product in aid kits marketing plus the proposed mass production of talsur range of animal birth control injections, he said, the company is poised for further growth.

## HARSHVARDHAN CHEMICALS

The directors of Harshvardhan Chemicals and Minerals have recommended a dividend of 20 per cent for the year ended March 1990. Sales turnover reached a new height of Rs. 835.77 lakhs from Rs. 555.25 lakhs in 1988 and Rs. 168.77 lakhs in six months ended March 1989.

Profit before interest and depreciation amounted to Rs. 93.02 lakhs against Rs. 56.42 lakhs in 1987, Rs. 67.38 lakhs in 1988 and Rs. 31.03 lakhs in 1989 (six months). Net profit (after providing depreciation Rs. 16.71 lakhs, interest Rs. 24 lakhs and provision for tax of Rs. 8.26 lakhs) amounted to Rs. 44.05 lakhs. Reserves and surplus have gone up to Rs. 76.01 lakhs.

The company is setting up sulphuric acid, oleum, chloro sulphonic acid projects at the cost of Rs. 12.85 crores. This will be ready for commercial production by April 1991. The detergent division recently successfully launched Hars detergent powder and cake in M. P Maharashtra and Karnataka.

The company plans to set up project of diammonium phosphate (DAP) an upgrading rock phosphate. The company also proposes to acquire intere in the textile mill of Ahmedabad.

## KANORIA CHEM

Kanoria Chemicals and Industrie Limited's chemical works division Ankleshwar in Gujarat has been commissioned. The unit was set up in technical collaboration with Perstorp AB Sweden. It has a capacity to manufacture 6,000 tonnes per annum of forma dehyde.

Production at the Ankleshwar con plex during 1989-90 was lower than th of last year because there were problem in utilising the new membrane techno ogy which was introduced in the country for the first time to mak pentaerythritol.

However, the group income went u by 40 per cent to Rs. 76.54 crore i 1989-90 from Rs. 54 crore in 1988-8 Its gross profit for the year was Rs. 1. crore as compared with Rs. 0.8 crore i the previous year. After providing fo depreciation and taxation and takin into account the balance brought fo ward from last year, the amount avai able for appropriation was Rs. 1.2 crore compared with Rs. 1.1 crore th year before.

## UDAIPUR PHOSPHATES

Mr. R.M. Goculdas, chairman Udaipur Phosphates and Fertilisers optimistic about the current year's ou look. The company has set a productio target of 82,500 tonnes for SSP (sing super phosphate) and 41,000 tonnes f sulphuric acid for the current ye ending March next. He is hopeful of se ling the entire production of SSP, su plus sulphuric acid and sulphur trioxid

# Hoechst Ankleshwar complex inaugurated

The new Ankleshwar complex of Hoechst India was inaugurated on Friday, August 17 by Mr. C.L. Jain, Finance Director & Wholetime Director on the Board of Hoechst India Limted. Speaking on the occasion, Mr. C.L. Jain said : ''India is an important partner in Hoechst AG global plans. Hoechst AG is therefore reinforceing its commitment to India whose growing market, well-developed infrastructure and competent human resources offer immense potential. Our parent company is sharing the latest technical know-how and participating financially in new projects as and when needed''. He thanked Hoechst AG for making the Ankleshwar complex a reality.

With a total investment of Rs. 25 crores made so far and another Rs. 10 crores proposed in the immediate future, the complex houses under one roof the pharmaceutical, agro chemical, veterinary, bulk as well as formulation units. Besides manufacturing products of the existing range and new introductions, the Ankleshwar complex will be the only unit outside Germany to produce the efficacious Rabipur vaccine against rabies. In the current year itself, the Ankleshwar complex is expected to contribute Rs. 70 crores to Hoechst India's turnover.

In Ankleshwar, as at Mulund, Bombay, Hoechst will continue to manufacture both basic material and formulations for agro chemicals as well as pharmaceuticals.

Located in the industrial township of Ankleshwar, Gujarat, the complex currently provides employment to 400 persons who have undergone in-house and on-the-job training at the plant itself. Like the other Hoechst plants the world over, Ankleshwar too has been provided with safety and environmental protection right from the design stage onwards. It has its own effluent treatment plant as well as a special biological waste treatment plant for Rabipur. Currently, Hoechst is among the top performers in drug and pharmaceutical exports. Exports from its pharmaceutical and agro chemical divisions today contribute 23 per cent to the company's total turnover. The Ankleshwar complex will futher boost Hoecsht's export efforts.

---

## INDIAN ORGANIC CHIEF MR. GHIA PASSES AWAY

Mr. Bhupatirai Maganlal Ghia, Chairman and Managing Director of Indian Organic Chemicals Ltd. died on August 23. Born in 1920, Mr. Ghia had over four decades of business experience.

Lovingly known as ''Kikabhai'' his innumerable friends and wellwishers, Mr. Ghia was endowed with a astute business sense. Mr. Ghia deepl involved himself with his flagship company. Indian Organic Chemicals Ltd (IOCL). He was the promotor and on of the first directors of IOCL.

Mr. Ghia was on the Board of Directors of reputed companies like Colour Chem Limited, Oriental Hotels Limited Asian Paints India Limited, Goa Carbon Limited, Windsor Foods Limited, Udaipur Phosphates and Fertilizers Limited and Chika Limited.

He worked on the Executive Committees of Indian Merchants Chamber Bombay, Chamber of Commerce and and Industry, and as the President of the Indo-German Chamber of Commerce Mr. Ghia leaves behind two sons.

---

## SC RESERVES DECISION ON CARBIDE SETTLEMENT

The Supreme Court reserved its judgement on petitions seeking review of the $470 million Bhopal gas disaster settlement. The judgement was reserved by the five judge-constitution bench headed by the Chief Justice, Mr. Sabyasachi Mukharji, after hearing concluding arguments of the Attorney General, Union Carbide Corporation and Bhopal gas victims.

ATTENTION!
TEXTILE MILLS AND PROCESS HOUSES
For Your Requirement Of
PRINTING ADHESIVES
for Flat Bed and Rotary Machines
TECHNOVA TRACING FILM
RTF and BLD

Contact Manufacturer:
BHARATI & CO.
Plot 394 D-7, Shradhanand Road, Matunga, Bombay 400 019.
Tel.: 4375582/4371701

# JB Petro to commence supplies of import substitution chemicals

UBPP, a Rs. 81/- crore joint venture f the UB Group with Tamil Nadu dustrial Development Corporation, set p for the manufacture of valuable nport substitute chemicals viz Propyene Glycols and Polyols, was formally naugurated at Madras by the Chief inister of Tamilnadu, Dr. M. Karunnidhi on 12th August 1990 in the resence of Honourable Union Minis-er for Petroleum & Chemicals, Mr. M.S. Gurupadaswamy.

The plant was built in a record time of sixteen months after site mobilisation, thus achieving international standards for speed of implementation of such plants.

The commissioning team of Technical Collaborators, viz M/s. Press-Industria and Montedipe have successfully stabilised the plant in a record time of 10 days and UBPP plants have already reached 100% capacity.

UBPP has since commenced supplies of Polyols under the brand name "UBPOL 3000 G1", Propylene Glycol Technical and Propylene Glycol IP. The products have met international quality standards and have already received ready acceptance by Indian consumers. Marketing of other glycols like dipropylene glycol, tripropylene glycol as well as that of useful chlorinated solvent, viz crude propylene dichloride have also commenced successfully.

With commencement of these supplies, UBPP is the first indigenous manufacturer to market these import substitution chemicals in the country. Nearly 100 MT of the products have been sold within one week of its commencement of supplies.

It is hoped that the Government of India will recognize the availability of these import substitution chemicals indigenously and save nearly Rs. 40 crores per annum on a recurring basis.

## LUBE EXPANSION PROJECT OF MRL CLEARED

The Union Government has approved the Rs. 164 crore lube expansion project of Madras Refineries Limited.

The new project which will increase production of lube base stocks from the current level of 140,000 tonnes to 270,000 tonnes and is expected to be completed in 33 months. It provides for the setting up of an additional extraction unit and the revamping of the existing de-waxing plant.

The Madras Refineries Chairman an Managing Director, Mr. H. Krishnamoorthy, said that the project, on completion, would help the company sav Rs. 62 crores in foreign exchange.

## 'CHITRA' NARAYANASWAMY PASSES AWAY

Mr. S. Narayanaswamy (85), a leading light of the Tamil Nadu industria scene, died at Madras on 25th night following a heart attack. He is survived by three sons. Popularly known as Chitra Narayanaswamy, he is the founder o the oldest and well-known stock broking firm, Chitra Co.

His name is synonymous with th Madras Stock Exchange. He has equally made rich contribution to the industria development of Tamil Nadu. He wa represented on the boards of severa companies and was also chairman o important companies like Seshasaye Paper Boards Limited, Mettur Chemicals, Aluminium Industries Limited (Alind) and the Tamil Nadu Chemical Products Limited.

He was president of Madras Stock Exchange for three terms and president of the South India Chamber of Commerce and Industry for two terms. Mr Narayanaswamy was also sheriff o Madras and a member of Tamil Nadu Legislative Council.

**Available from Ready Stock at Competitive Rates**

ISOPROPYL BROMIDE
ISOPROPYL ALCOHOL
ISOBUTANOL
LIQUOR AMMONIA 910-888
METHYL ETHYL KETONE
METHYL ISOBUTYL KETONE
METHANOL R.C.F.
METHYL DICHLOROACETATE
MONOETHANOLAMINE
METHYLENE DICHLORIDE

NITROBENZENE
N-PROPANOL
OLEIC ACID PURE/TECH.
ORTHO DICHLOROBENZENE
PERCHLORO ETHYLENE
PHENOL CRYSTAL/LIQUID
PYRIDINE PURE
PINE OIL COMM.
PEG 200/400
SORBITOL

SOYALECITHIN
1-1-1 TRICHLOROETHANE
TRICHLORO ETHYLENE
TOLUENE
XYLENE
TRIETHYLAMINE
TETRACHLOROETHANE
TRIETHANOLAMINE
TRICHLOROETHYLENE
(SUBSTITUTE)

Please Contact:

**MAKS CHEM INDUSTRIES**

89, Princess Street, Pirbhoy Mansion, 2nd Floor, Bombay 400 002.
Phones: Office: 312358/257898/254363 Resi.: 8115229/8227223/6126969 Gram: "MAKSOL"
WE BUY CHEMICAL WASTE & DISTILLED SOLVENTS REGULARLY. WE REQUIRE CRUDE SOLVENTS LIKE IPA * CHLOROFORM * C.T.C. * TEA * METHANOL * ACETONE * PHENOL
Factory: Plot No. 1322, G.I.D.C., Opp. Hitech Capsule Factory, Sarigam, Dist. Valsad (Gujarat).

FOR YOUR IMPORT REQUIREMENTS OF

**BISPHENOL A**
**CUMENE**
**D.O.P.**
**2-ETHYL HEXANOL**
**ISO PROPANOL**
**MELAMINE**
**PENTAERYTHRITOL**
**PERCHLORO ETHYLENE**
**PHENOL**
**STYRENE MONOMER**
**SODIUM TRIPOLY PHOSPHATE**
**TOLUENE DI-ISOCYANATE**

PLEASE CONTACT WITH YOUR SPECIFIC REQUIREMENTS

**M/s. OCEAN TRADING CORPORATION**

329, A-Z Industrial Estate, G. Kadam Marg, Lower Parel,
BOMBAY - 400 013

**Tel. No.: 4921664 / 4921669 / 4921711**
**Telex No.: 011 71564 DAYA IN**

---

**IMPORTED ANALYTICAL INSTRUMENTS**
**AVAILABLE EX-STOCK**

1. **SHIMADZU UV-VIS SPECTROPHOTOMETER**
2. **SHIMADZU HPLC SYSTEMS**
3. **BROOKFIELD VISCOMETER**
   **DIGITAL & DIAL READOUT**
4. **PERKIN ELMER GAS CHROMATOGRAPH**
   **MODEL - 8700**
5. **PERKIN ELMER FTIR SPECTROPHOTOMETER**

Contact: Mr. N.K. Darji

**M.J. EXPORTS LTD.**

113, Jolly Maker Chambers No. 2, Nariman Point, Bombay - 400 021.
Phone: 2020644 (7 lines) * Fax: (22) 2048030
Cable: SYNEXPORT
Telex: 11-4677 MJAY IN * 11-2478 MJAY IN * 11-4810 MJAY IN

AVAILABLE
INDIAN AND IMPORTED

**OIL LEMON**
4% Cital
**OIL BERGAMOT**
**GERANIUM OIL**
**OIL ORANGE**
4% Cital
**CARDAMUM OIL**
100% Pure & Natural Sweet
Double Distilled
**CARDAMUM EXTRACT**
100% Pure & Natural

*DEALERS ENQUIRIES SOLICITED*

* * *

**SYNTHETIC POLYESTER RESIN (35/210 KG)**
Grades
G.P. -- Car Patch
Choke -- Marble
F.R.P. -- Rooflite
Isophthalic Polyester Resin
Isophthalic Gel Coat
G.P. Gel Coal
(For Surface Finishing)

* * *

*Available Solvents*
**TOLUENE/BENZENE/XYLENE**
**HEXANE/I.P.A./ACETONE**
**M.E.K./DIACETONE/EDC**
**CYCLOHEXANONE/STYRENE**
**ETHYL ACETATE/CIX**
**TRICHLORO ETHYLENE**

UNITED CHEMICALS
WE MEAN BUSINESS

6, Shrinathji Sadan,
64, V.V. Chandan Street, Masjid,
BOMBAY 400 003.

Tel: 328795
Gram: SPEEDCHEM, Bombay 400 003.
Telex: 011-2846/011-2575/CTO-BY-IN
Attn: TD-132
Fax : 022-2024202, 022-2024001
Attn: AC-163

---

NOW READILY AVAILABLE FROM READY STOCK

**TRI ETHANOLAMINE**
**DI ETHANOLAMINE**
**MONO ETHANOLAMINE**

Manufactured by
**P.K. Velu & Co. (Pte) Ltd.**

Contact Authorised Stockist
FOR MAHARASHTRA AND SOUTH

**ATUL CHEMICALS**

*Sales Office:* 63/B, Princess Street, Devkaran Mansion, 2nd Floor,
Bombay 400 002.
Telephone: 319510/316366; Resi.: 8227125

---

For Your Requirement of
The Most Powerful Bleaching Agent:

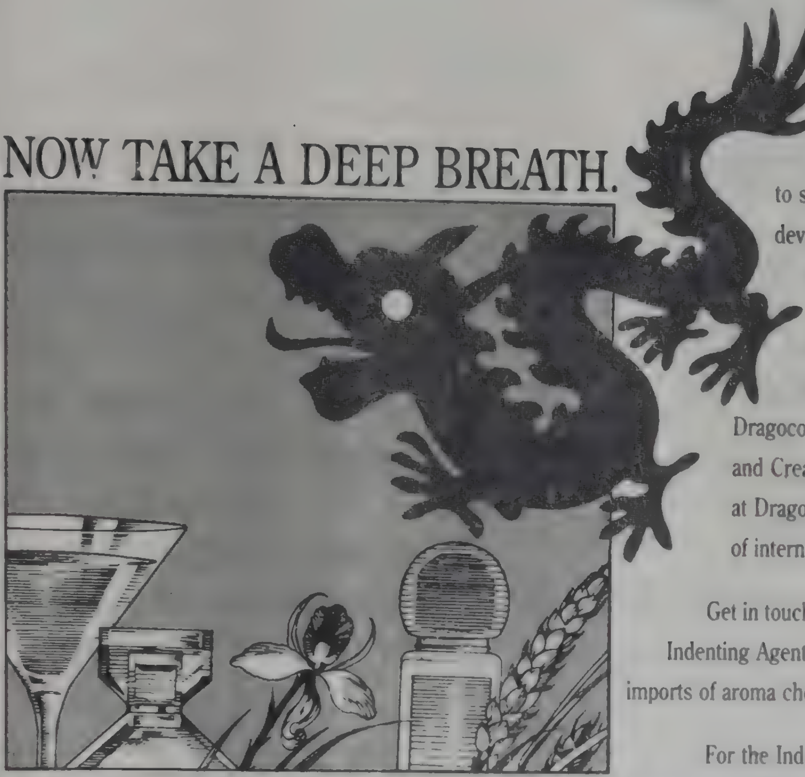
**SODIUM CHLORITE**

50%, 80% Flakes/ 23% Liquid
Used For Bleaching of:
Paper Pulp, Cellulose, Textiles, Synthetic Yarn,
Oils, Waxes, Guar Gum etc.
Manufactured by:

**Zed Chem Pvt. Ltd.**

**Office:**
Jaydip, 67 Chaitanyanagar,
Near Sardar Patel Stadium,
Ahmedabad 380 014.
**Tel.: 401423**

**Bombay Office:**
**Eastern Industries**
Kasturchand Mill Estate,
Dadar (West) Bombay 400 028.
**Tel.: 4221568/4304485**



NOW TAKE A DEEP BREATH.

The dragon is here. Symbol of the world leader in speciality aroma chemicals.

Dragoco Gerberding & Company GmbH of West Germany is ready to usher in a new era for the Indian flavour and fragrance industry with unique speciality aroma chemicals. Like it already has in five continents through its development centres and technical application laboratories all over the world.

Now it's your turn to take your pick from the Dragoco range of 1000 speciality chemicals. And to stay on top of the latest developments in aromas as they happen across the globe.

Drachem Speciality Chemicals Ltd. is a joint venture with Dragoco. With Technical, Marketing and Creative personnel trained at Dragoco, to bring you products of international quality.

Get in touch with Drachem, the Principal Indenting Agent of Dragoco in India for your imports of aroma chemicals.

For the Indian flavour and fragrance industry, it will be a breath of fresh air.

**Drachem Speciality Chemicals Ltd.**
A 203 Blue Cross Chambers Infantry Road Cross
Bangalore 560 001 Tel: 563083/579228/570526

**C/o Chemicals and Plastics India Ltd.**
Jitendra Industrial Estate Andheri Kurla Road
Andheri East Bombay 400 093
Tel: 6346474/6346475

HTA 9167 A

**Unichema International**

(UNILEVER GROUP)
West Germany/Holland/U.K./Australia/Malaysia
OFFERS:

for **LUBRICANT INDUSTRY**
- Hindered Esters (Fully Synthetic)
- Non Hindered Esters (Fully Synthetic)
- Antiwear/Lubricity Improvers
- Anti-Corrosion Additives
- Surface Active Agents

for **POLYOLEFIN INDUSTRY (Plastic Additives)**
- Stearamide
- Erucamide
- Oleamide
- Ethylene-Bis-Stearamide
- Stearic Acid
- Glycerol Mono-Oleate
- Glycerol Mono-Stearate

For imports into India and further details
Please Contact:
**SOLE AGENTS IN INDIA**

se

soofi enterprises

1317, Dalamal Tower, 211, Nariman Point,
Bombay 400 021.
**Tel. Nos.: 2043044/233074**
**Tlx. No.: 0118-4187 SUFI IN**
**Cable: SOOFICHEM**
**Fax No.: 2047657**

We also offer:

**LACTOSE I.P.**
**GUM ROSIN (WW & WG Grades)**

NOW ON SALE

**CHEMICAL WEEKLY BUYER'S GUIDE**

**EIGHTH EDITION (1989)**

**3 Volumes, pp. 1868**

The most comprehensive survey on the Indian chemical industry to-date. Covering organic and inorganic chemicals, fine chemicals, bulk drugs, dyes, pesticides, fertilisers, paints, plastics, speciality chemicals etc.

**BOOK EARLY TO AVOID DISAPPOINTMENT**

Copies can be obtained from our offices in Bombay and Madras

**Price Rs. 500 (Plus Rs. 75 for postage and handling; and Rs. 7 for outstation cheques) Payable in advance through cheque/demand draft/money order. No VPP please.**

Contact:

**SEVAK PUBLICATIONS**

**BOMBAY OFFICE:**
306, Shri Hanuman Industrial Estate,
G.D. Ambekar Road, Wadala,
Bombay 400 031.
**Phones: 4131198, 4120743**
**Telex: 011-76053**

**MADRAS OFFICE:**
Room No. 9, 3rd Floor, Wellingdon Estate,
24, Commander-in-Chief Road,
Madras 600 105.
**Phones: C/o. 471659/419265**
**Telex: 41-6290**

NVIRONMENT CLEARANCE

# Move to raise investment ceiling for projects

The Environment and Forests Minis- y has submitted a set of proposals to ne Cabinet, which if accepted, would onsiderably limit the role of the Minis- y. One of the proposals seeks to raise ne investment ceiling for projects hich require environment clearance om Rs. 20 crores to Rs. 100 crores.

This proposal, critics point out, would ave free the small and medium-scale ctories and industries which come up nywhere and everywhere posing health nd environmental hazards. This is also contradiction to the Minister of State or Environment, Mrs. Maneka Gand- i's plea that the investment ceiling for nvironment clearance be reduced to s. 5 crores.

The proposals are contained in a doc- ment "environmental assessment of evelopment projects" reportedly leared by the Cabinet Minister, Mr. ilamani Routray, for submission to the abinet. The Committee of Secretaries ill consider the document first. While onceding that most of the departments ave not acquired environment impact ssessment (EIA) expertise in the last n years, the document suggests crea- on of environment cells in all devel- pmental departments to conduct their wn EIA.

It is pointed out that the Environment linistry was set up ten years ago ainly to conduct EIA. The Ministry as standing appraisal committees for ver valley, industrial mining, thermal ower and atomic energy projects. The ommittees consist of members drawn om various fields of advanced study. etting up EIA in developmental epartments would mean that environ- ent concerns would be subservient to e interests of the projects. Moreover, is would leave the Environment inistry practically redundant, sources the Ministry said.

Meanwhile, Mr. Routray is reported to have cleared several industrial, chemical and river valley projects held up by the Ministry. Several of these projects, the sources said, had not been cleared because of inadequate clarifications on EIA. The progress report, submitted by the Ministry for the month of July, to the Cabinet, states that "a record number of projects including 116 relating to the forest land and 76 in the environmental side have been cleared". These include several power generation projects, both thermal and hydel and industrial and chemical plants.

The Adirapally hydroelectric project in Kerala is one of the controversial projects. According to EIA, about 104 ha forest land to be taken up by the project was vital for maintaining the ecological balance in the region. The area is inhabited by elephants, wild buffaloes, wild pigs, giant squirrel, Indian wolf and Nilgiri langoor. Moreover, the project would render the famous Adirapally Falls dry.

Another is the Vindhyachal super thermal power project stage-II. The Minister of State for Environment and Forests had stipulated that clearance would be given only if a desulphurisation plant to arrest emission of $SO_2$ is put up. Now the project has been cleared without fulfilling this condition.

An ONGC project has been sanctioned in an area earmarked for a regional park. The 570,000 mtpa Thane, propane recovery unit at Uran has been severely objected to by the Bombay environmental action groups and the local people. Now a pipeline to supply methane and propane to the Maharashtra gas cracker project is to be laid along the sea coast.

Sources close to Mrs. Maneka Gandhi also said that several decisions taken by her when she was the junic minister under the Prime Ministe Mr. V.P. Singh, have been reversed b Mr. Routray. Sources also claimed tha none of these files were sent to Mrs Gandhi after the "reallocation" of th work in the Ministry. However, th Minister herself declined to comment o these reports.

---

## ANIL STARCH PLANS TO SELL BHAVNAGAR UNIT

Anil Starch Products Ltd. of Lalbhai Group has proposed to sell its Bhavnagar unit producing super phosphate and sulphuric acid. The management of the company has sought the powers from the shareholders to sell the unit by a special resolution in the annual general meeting which was presided over by its Managing Director, M. Shrenik Kasturbhai Lalbhai.

The unit which was working partially has a production capacity of 34,000 tonnes of super phosphate and 18,000 tonnes of sulphuric acid per year. Though there was no stock piling of its production, the unit was limping. The proposal to sell the unit is in a primary stage and no concrete offer has been received by the company. However, the sale of the unit will add substantial amounts in the profits of the company.

The working of Anil Starch products during the current year was satisfactory and sales during the first month were higher at Rs. 15.61 crores as against Rs. 13.90 crores in the corresponding period of the previous year.

The company has planned to modernise its forging unit at Ahmedabad at a cost of Rs. 60 lakhs by installing new machinery. Mr. Shrenikbhai pointed out that the demand for forging was increasing due to good export prospects and fast development of tractor and automobile industries. The company has also decided to modernise its starch factory at a cost of Rs. 1 crore.

# Fresh uranium capacity essential to feed world nuclear power industry

The OECD Nuclear Energy Agency (NEA) and the Internaional Atomic Energy Agency (IAEA) have just published a new joint report on world uranium resources, their production and demand commonly known as the ''Red Book'', based on data provided by over 40 countries outside centrally planned economies (WOCA).

According to a press note issued by the IAEA, towards the end of the century, supply and demand should be in better balance than in previous years. By 2005, uranium requirements for nuclear reactors are projected to be around 53,000 tonnes a year. Assuming all planned and prospective production centres are developed, no serious production shortfall from low-and-high-cost resources is expected.

Even on a low-demand scenario, which is an extension of the present trend of uranium demand, currently ''known'' resources will not be sufficient to sustain production capability to cover projected demand after 2005. Increasing amounts of the additional uranium needed to cover the expected production shortfall would have to come from new discoveries. A considerable amount of exploration and development effort will be required, on a timely basis, before these potential supply possibilities can be realised.

Both the low and high projections of nuclear power growth are lower than those shown in the 1986 Red Book. The current projections of nuclear capacity indicate an increase from about 335 Gigawatts (GWe) in the year 2000 to 600 GWe and 860 GWe in the year 2030 for the low and high scenarios respectively. These projections are based on the assumptions that public policy and attitude to nuclear power in the foreseeable future will not be radically different from those at present. Additional conclusions derived from the statistics on uranium resources, exploration and production include:

Reasonably assured resources, recoverable at a cost of $80/Kg of uranium or less, have remained virtually unchanged since the last assessment in early 1987. Resources recoverable at $80-130/Kg. have decreased by a little over 20,000 tonnes to 655,000 tonnes.

Additional resources in the low-cost category decreased by over 110,000 tonnes to about 770,000 tonnes of U, the major reductions being reported in South Africa. They have been discovered in the less well-known parts of deposits. Total ''known'' uraniur resources are estimated at 3.4 millio tonnes as of January 1, 1989, a decreas of about 180,000 tonnes from earl 1987.

Additional resources of the conver tional type, potentially recoverable a $130/kg or less, could exceed 10 mi lion tonnes.

Total uranium exploration expendi tures in WOCA for 1987 continue to b in $160 — 180 million range in currer dollars. Despite these exploratio efforts, no significant new uraniu deposits have been discovered since th Kintyre ore body was located in Austra lia in 1985.

---

## FILTERING SYSTEM

The modular ''Vitalizer II' can b customized for residential and sma commercial applications. Installed und the sink, it features filters, a carbo filter, and a reverse osmosis module th removes sediment, chemicals, heav metals, and other contaminants. It pro duces from 38 to 760 litres/day, depend ing on options, which include a storag tank, ultraviolet light, and a deionizatio module. Agents are sought.

For further details write to Trysa Research, Inc., Dept. CN, 1122, S. Sta Street, 22, Provo. Utah 84601, USA

BP · MEKP · TBHP · Jain · TBPB · DTBP · BP · TBHP · TBPB · DTBP · BP

- BENZOYL PEROXIDE
- M.E.K. PEROXIDE
- T-BUTYL HYDROPEROXIDE
- T-BUTYL PER BENZOATE
- DI TERTIARY BUTYL PEROXIDE
- ALUMINIUM ISOPROPOXIDE

DELHI: RISHABH TRADING CO.
GALI MATKE WALI,
SADAR BAZAR,
DELHI - 6.
Tel: 7532197

CALCUTTA : B. JAIN & CO.
B-20, BAGREE MARKET,
71, CANNING STREET,
CALCUTTA - 1.
Tel: 250276

Contact Manufacturers
**Jain & Jain**
214/A JANJIKAR STREET
BOMBAY-400 003
PHONE:
323097 • 321652 • 328765

BP · MEKP · TBHP · TBPB · DTBP · ALISOP · TBHP · TBPB · DTBP

# Oswals to set up power project

The Oswal group headed by Mr. hey Oswal has decided to set up a wer project. One of the first big group come forward to set up the power oject ever since the Government rew open this sector to private, this ould be the first big venture of the swals this year.

A memorandum of understanding IoU) would be signed shortly between e Oswal Agro Mills and the Uttar Pra- sh State Electricity Boards (UPSEB) r a 260-mw project to be set up in nahjahanpur, just next to the fertiliser roject of Oswals on the HBJ gas pipe- ne. The Oswals would sell their entire utput to UPSEB.

The gas-based project is estimated to ost about Rs. 250 crores and would be ommissioned by 1992. Oswal Agro ould pump in its Rs. 150-crore liquid- y to part finance the project. The bal- nce Rs. 100 crores is proposed to be aised from the issue of non-convertible ebentures.

Oswals, who are not new to power eneration, have decided to have no for- ign collaborators for this mega project. nother company of the group, Bindal gro, which is setting up the fertiliser roject in Shehjahanpur, is also setting p a 70-mw project for captive supply to the fertiliser plant. However, the equipment is proposed to be imported. Negotiations are on with West German and US firms for import of boilers which accounts for the major chunk of the total project cost.

Interestingly, though the Oswals would be signing a MoU with UPSEB for the gas-based power project next week, the gas for its fertiliser plant is not yet tied up. Gas Authority of India Ltd. (GAIL) which is supposed to provide gas from the HBJ pipeline has imposed stringent conditions for the supplies. It is learnt that GAIL has indicated to the Oswals that if the project is not commissioned within 24 months of the zero date, it would forfeit Rs. 17 crores paid by the Oswals as security. Mr. Abhey Oswal wants that the company should be given a grace period of another six months to discount for unforeseen circumstances.

As a matter of fact, Bindal Agro had assured the then Government and the investing public that it would set up the project within 36 months of the zero date. The zero date begins from September 23 this year. However, according to Mr. Oswal, the gas supply for the power project should not be linked with gas supply to the fertiliser plant though both are being set up next to each other.

According to him, the company is going into sugar production in a big way. It has received a fresh licence to set up another sugar mill in Uttar Pradesh with a capacity to crush 3000 tonnes per day. It has also been allowed to expand its existing sugar mill capacity in Phagwara, Punjab to 6000 tonnes per day from 4,000 tonnes. The two together would cost about Rs. 70 crores more.

The company made a profit of Rs. 50 crores in 1989-90. This year's profit is expected to be around Rs. 75 crores. The total equity of the company is around Rs. 400 crores.

## ROTARY PUMP

Flex-I-Liner Plastic Pump designed for low maintenance, meters sodium hypochlorite. This self-priming, sealless rotary pump is driven by a d.c. motor regulated with a controller. It is said to be suitable for flows to 76 litres/min and pressures to 50 psi at temperatures to 85°C. Only its flexible liner and solid plastic body block come in contact with the fluid being pumped. Agents are wanted.

For further details write to Vanton Pump & Equipment Corp., Dept. CN, Hillside, New Jersey, 07205, USA.

FOR YOUR REQUIREMENTS WITH MODVAT BENEFITS

EPICHLOROHYDRINE
ACRYLAMIDE
MICROCRYSTALLINE WAX
(1080, 125 & 139)
ACRYLIC ACID
ADIPIC ACID
PERCHLOROETHYLENE
POTASSIUM FERROCYANIDE
PARAFORMALDEHYDE
MELAMINE
ISOPHTHALIC ACID
TRIETHYLENE GLYCOL
PINE OIL
TURPENTINE
GUM ROSIN
DICYANDIAMIDE (D.C.D.A.)
ISOPHORONE
BISPHENOL A
PROPYLENE GLYCOL
MALEIC ANHYDRIDE
TITANIUM DIOXIDE
FURFURYL ALCOHOL
THIOUREA
TUNG OIL
LITHOPONE

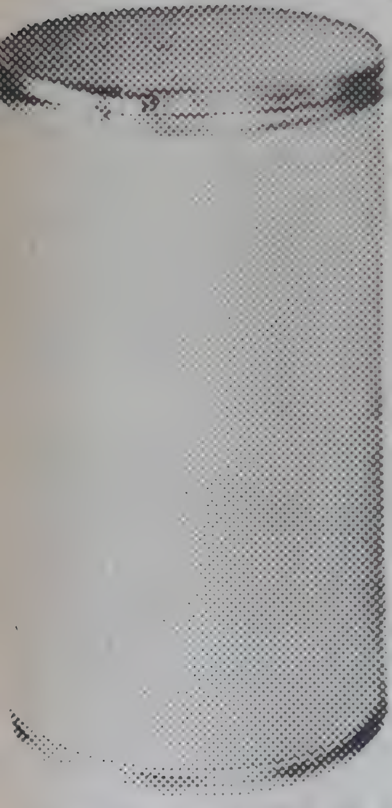
Please Contact:

SPECIALITY CHEMICALS

407, Yogeshwar Building, 135/139, Kazi Sayed Street, Bombay 400 003.
Phones: 336828/344286 Telex: 011-3258 DUCO IN Gram: CHEMILITY

**Atlas Fibre Drums**

- Are light in weight
- Low tare weight reduces transportation and handling costs. Ideal choice for export packaging
- Keeps your products safe from contamination, fungus, moisture and corrosion because the packaging material is inert
- Can withstand impacts and jolts
- Are designed for stability
- Strength/Weight Ratio is high if stacked upright
- Can be conveniently stacked
- Lid can be fully opened to allow easy filling or emptying
- Locking system prevents pilferage
- Surface suitable for Printing/Stencilling for product identification. Varnish and Waxing provided on specific orders



**Used For :**

- Basic drugs, Drug intermediates and Pharmaceuticals.
- Chemicals and Allied Products
- Food Products
- Cattle/Poultry feeds/drugs
- Plasticizers and Resins
- Dyes and intermediates
- Pesticides
- Engineering Goods and Foundry Flux.
- Soaps and Detergents.
- Metal Powders.

RANGE
DIAMETER :
10" to 20"
HEIGHT :
6" to 44"
CAPACITY :
7 Lit. to 225 Lit.

**ATLAS FIBREPACK INDUSTRIES**
NEAR GRID STATION INDUSTRIAL AREA,
ODHAV, AHMEDABAD–382 415.
TEL.: 368436-368437. GRAM : ATLAS DRUMS
TLX.: 0121-6677 ADCI IN

Kruti Comm

**USE QUALITY ATLAS FIBRE DRUMS**

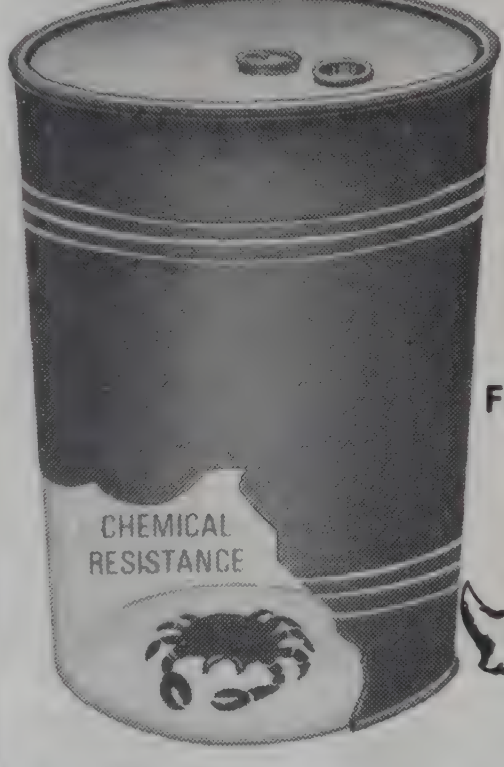
---

DO YOU HAVE PACKAGING PROBLEMS?

THIS
THE SOLUTIC

**HDPE Polylined M. S. Drun**

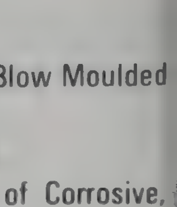
HDPE POLYLINER IS JACKATED IN M.S. DR



INTRODUC
FOR
FIRST T

HDPE POLYLI
M.S. DRU

DOUB
PROTECTI
FOR MAXIM
SECUR



- Chemical resistance–Virgin HDPE Blow Moulded leakproof liners
- Convenient capacity **SIZE 50 LITER**
- Solution to the safe transpotation of Corrosive, Hezardous or High Value Chemicals

**MINI SARVODYOG SIR**
Manufacturers of HDPE Polylined,
M. S. Galvanished & Epicoated DRUMS

214, VITHAL UDYOGNAGAR,
VALLABH VIDYANAGAR–388 121. Ph. 30531

# Rs. 1.6 cr. loss by Calcutta Chem

The Calcutta Chemical Company nited, which suffered a net loss of . 1.63 crore during 1989-90, faces an certain future. The management has en unable to draw up a strategy to turn company around and the only obser- ion made by the chairperson Mrs. ima Chatterjee, at the annual general eting August 27, was that "the com- ny should reach break-even point in not-too-distant future".

Shareholders wanted to know when artments would come up at the Pan- ia Road property of the company, as licated earlier by the Shaw Wallace nagement.

The questions were prompted by a t income of Rs. 42.55 lakh indicated the annual report for the first time. earlier year, there was no income der this head. No clear answer was thcoming from the management but s understood that the land and buildings have been rented out. Company sources were uncertain about the plan to develop the property due to difficulties in evicting the present tenants.

In fact, loss for the year was sharply reduced as three incomes not shown in the earlier year, were included in the accounts this year. These are Rs. 42.55 lakh from rent, Rs. 14.73 lakh from technical fees and Rs. 10.60 lakh from processing charges. Replying to questions on these points, the company secretary, Mr. P. Saha, told shareholders that technical fees received from Shaw Wallace and another company were likely to continue to pour in.

The company's rehabilitation plans are under review by the Industrial Development Bank of India which was appointed as the operating agency by the Board for Industrial and Fiancial Reconstruction. Mr. Saha said that the development of the Panditi Road property was linked to the rehabilitation plan. The net loss of Rs. 1.63 crore for the year was lower by 42 per cent on an annualised basis compared to Rs. 1.52 crore for the previous period of nine months. The company claimed that this was a result of the reduction in processing and packaging costs. However, the company has heavy outstandings of sales tax (with interest) of Rs. 1.10 crore, excise duty of Rs. 5.67 lakh and income tax of Rs. 16,662. According to the chairperson's report capacity utilisation was low "due to inadequate financial resources and certain industrial relation problems." Sales, however, went up to Rs. 16.25 crore against Rs. 11.10 crore for the previous nine month period largely due to higher sales of Margo toilet soap. Mr. Saha side stepped a question on whether the company's board had adopted a resolution suggesting a merger of the company with Shaw Wallace and merely referred to the rehabilitation package.

NOW AVAILABLE

SOFT ACID SLURRY
(LINEAR ALKYL BENZENE SULPHONATE)
SULPHONATED WITH SULPHUR TRIOXIDE ($SO_3$)

Manufacturer

**BEC Chemicals**

**Unit of Bhilai Engineering Corporation Limited**
Satyam Commercial Complex, Link Road,
Bilaspur 495 001 (MP).

**Phones: 3516, 4947 Telex: 0273-203 BECF IN**

# Varinder Agro Chemicals' expansion scheme

Varinder Agro Chemicals Limited is a profitably functioning fertilizer unit with its manufacturing facilities for sulphuric acid and single superphosphate in Punjab. The initial capacity of 66,000 tonnes of single superphosphate and 33,000 tonnes of sulphuric acid annually has been effectively utilised and the turnover and profits have risen in recent years with systematic modernisation and upgradation of technology. The capability is to be further raised to 75,000 tonnes of sulphuric acid with a corresponding increase in facilities for superphosphate. It is scheduled that the expanded facilities should be in full operation by the end of this year.

## Paper mill project

While a lucrative business has been developed in the production and marketing of fertilizer which is in great demand in the region, it has been decided to diversify activities by taking up the manufacture of writing and printing paper of different varieties with the use of agricultural wastes like rice straw and wheat stalks available in abundance in the area.

This plant also will be located in Sangrur district in Punjab, which has advantage from the point of view of easy access to raw material sources and marketing.

## Convertible bond issue

The capacity of the plant will be 60 tonnes daily and the outlay will be Rs. 33.75 crores. The required funds are being raised through the issue of fully convertible bonds for Rs. 18 crores. Term loans have been arranged for Rs. 12 crores from financial institutions, while internal resources will fill the balance of Rs. 3.75 crores. The holders of convertible bonds will be eligible to get the five equity shares of Rs. 10 each at a premium of Rs. 20 per share in six months from the date of allotment. The balance of Rs. 150 per bond will also be convertible into five equity shares on the same premium in 12 months. The management will be accepting subscriptions up to 15% in excess of the notified amount in the event of oversubscription. Out of the issue, the existing shareholders can take up 1.47 lakh bonds on a right basis. One lakh bonds will be offered to the holders of 14% convertible debentures (series 1) in the ratio of five debentures for every bond holder. Seventy thousand bonds will be taken up by non-resident Indians, one lakh bonds by financial institutions and mutual funds and 30,000 bonds by employees. The remaining 1.53 lakh bonds of Rs. 300 each are being offered for public subscription on September 3. As already stated, the performance has been encouraging in recent years. The turnover was Rs. 38 crores and the
profit, before depreciation and taxati
Rs. 778.93 lakhs during the 18 mon
ended December 31, 1989 against
17.31 crores and Rs. 260.22 lakhs in
previous 12 months. A maiden divid
of 24%, taxable, absorbing Rs. 60
lakhs was paid on equity capital
Rs. 250.47 lakhs, out of the profit, a
taxation of Rs. 444.49 lakhs.

Mr. R.K. Garg, a director of the c
pany has stated that it will be possi
to pay an attractive dividend on
enlarged capital even with the profits
the existing business and that there
be a substantial increase in turnover
profitability after the new paper
goes on stream in 1992. Reserves st
at Rs. 859.16 lakhs on June 30, 1990
the paid up capital also has increased
429.94 lakhs following the allotment
equity shares to the holders of conve
ible bonds (series 1) of Rs. 225 each
Rs. 807.30 lakhs.

With the benefit of the expand
facilities of the super phosphate and s
phuric acid unit derived partly
1990-91, the performance is expected
be much better than in 1987-89 in
six months ended June 30, 1990,
turnover was comparably higher
Rs. 18.26 crore and the net profit bef
depreciation and taxation at Rs. 282
lakhs or an increase Rs. 46.5 per c
on an adjusted basis in relation to pr
of previous 18 months.

ESTD: 1969
For Your Requirements Of:

PARA TOLUENE SULPHONIC ACID
(P.T.S.A. -- 98%-99%)

PLEASE CONTACT MANUFACTURERS

**REENA CHEM**

**Regd. Office & Factory:**
C/3/15, GIDC Estate,
Nadiad, Gujarat-387 001
**Phones: 4661/4383**
**Cable: "CHEMSTICK"**

**Bombay Office:**
1106, Maker Chamber V,
221, Nariman Point,
Bombay - 400 021.
**Phones: 240842/225118**

# Large inventory of acrylates with IPCL

The public sector Indian Petrochem- ls Corporation Ltd. (IPCL) has umulated an inventory of acrylates ued at Rs. 3.26 crores as on July 90. Acrylates are chemicals used in tile printing, dyestuffs and pigments, nts, adhesives and the like. IPCL is major producer of acrylates in the ntry.

Manufacturers attribute the inventory ld-up to large-scale under-invoicing traders. Though acrylates are under pendix 3A of Import-Export policy, ent liberalisation in the policy has bled imports through REP licences.

There appears to be some substance the allegation of under-invoicing. mbay Customs records show that de imports of acrylates are consistly at cheaper prices than imports by ual users during the same month by much as US $200 a tonne. Under the vailing prices, there is little difference in the landed price of imported material and the selling price of indigenous material. However, by under-invoicing, traders are able to save 149 per cent customs duty on the under-invoiced value, according to industry sources.

The Indian acrylate industry is already operating at low capacities because the installed capacity of 13,000 tonnes is more than twice the demand of less than 6,000 tonnes.

In recent years, IPCL invested about Rs. 3 crores in upgrading its acrylate facilities and installing a 500 tonne storage plant. The only other unit, that of Raj Prakash Chemicals Ltd., uses an indigenous technology to produce various grades of acrylates.

At a meeting held by the director general of technical development (DGTD), New Delhi, on August 20, to discuss availablity of acrylates, manufacturers demanded that the product be shifted to Appendix 2B so that it does not become eligible for import against REP licences. At the end of the meeting, producers were asked to apply for transfer of the product to Appendix 2B.

## AASU ENDS OIL BLOCKADE

The All Assam Students' Union (AASU) withdrew its 13-day old crude oil blockade on August 27 following a written assurance from the Chief Minister, Mr. Prafulla Kumar Mahanta, on August 26.

The AASU imposed the blockade on August 15 halting supply of crude oil to the refineries in protest against the alleged indifferent attitude of the Centre and the State Government in implementing the Assam accord and to press for the cancellation of the construction of the crude loop line.

Offers invited for following Raw and Packing Materials available with us for disposal.

| Sl. No. | Name of the Material | Qty |
|---|---|---|
| 1. | CALCIUM GLYCEROPHOSPHATE BPC | 6.923 kgs. |
| 2. | CHOLINE CHLORIDE I.P. | 13.095 " |
| 3. | D.L. METHIONINE N.F. | 19.160 " |
| 4. | PAPAIN BPC | 30.015 " |
| 5. | FERROUS SUCCINATE I.P. | 24.5 " |
| 6. | GLYCONO DELTA LACTONE I.P. | 214.5 " |
| 7. | CLOVE OIL I.P. | 310.0 " |
| 8. | CINNAMON OIL I.P. | 296.4 " |
| 9. | METHYL SALICYLATE I.P. | 9.0 " |
| 10. | THYMOL I.P. | 30.7 " |
| 11. | TURMERIC POWDER | 41.7 " |
| 12. | 10 ML. WHITE VIALS | 38,000 Nos. |
| 13. | BAKELITE CAPS (for 10 grams Balm bottles) | 6,42,000 " |
| 14. | BLACK RUBBER TEATS | 10,400 " |
| 15. | RED RUBBER PLUGS | 50,000 " |
| 16. | NOSCAPINE | 1.850 kgs. |

Kindly Contact the following address:

**M/s. JUGGAT PHARMA (P) LTD.**

35, Sampangi Tank Road, Bangalore - 560 027
Phone No.: 224661

# OPEC close to production hike pact

Ten of the 11 OPEC Ministers have tentatively backed a deal that would permit increased oil production by Saudi Arabia, Venezuela and some other nations to help offset losses arising from the West Asia crisis.

Only Iran failed to support the arrangement, which would temporarily lift the cartel's supply quotas. "I think it is a big mistake from OPEC," said the Iranian Oil Minister, Mr. Gholamreza Aqazadeh, after the morning discussions with other cartel officials.

Iraq and Libya did not attend the talks held by the Organisation of Petroleum Exporting Countries. The ministers had briefly post-poned a meeting scheduled to approve the arrangement to give them more time to try to persuade Iran to go along. Mr. Aquazadeh said western nations first should take steps to draw down their oil stocks to help meet the crisis. "It is not the responsibility of OPEC only," he said. "For this reason, I cannot support an increase in production".

The cartel's increased output would help fill the gap of about four million barrels of oil a day which has been pulled off the market by the international embargo against Iraqi and Kuwaiti oil. The prohibitions were imposed after Iraq invaded Kuwait on August 2.

Most countries have already agreed to sanction production increases for the simple reason that (the countries) are going to do it anyway, a source, who demanded anonymity, said.

## COKING COAL CAN BE IMPROVED BY ADDING SRC

Scientists have found a means of reducing the considerable amount of coking coal that is imported by the country, with the finding that indigenous coking coal can be improved
adding Solvent Refined Coal (SRC
Solvent refined coal is obtained as
solid pitch like product during a proce
evolved by the Central Fuel Researc
Institute (CFRI), Dhanbad.

The process involves solvent extra
tion of non-coking coal, oil agglome
ated washery middlings and lignite, o
tained after hydrogenation of coal
elevated temperature and pressur
When CFRI scientists added 5 to 10
solvent refined coal to conventional co
blends, there was considerable improv
ment in the fluidity, plasticity, coke ty
and coke strength, besides reduction
the ash content. For their investigatio
on the use of SRC in coking blend
bulk samples were supplied to a
tested at the Research and Developme
Centre for Iron and Steel, Steel Autho
ity of India Limited (SAIL), Ranchi a
CFRI. It may be possible to replace t
imported coking coal by adding 10 p
cent SRC with 8 per cent ash conte
says a CFRI release. In India, ste
plants are attempting to limit the a
content in coal blends to 17 per cent
blending imported low ash coals as
sweetening agent in coking blend
especially for the high capacity bla
furnaces with stringent specificatio
for coke strength and reactivity.

## MP MINERAL PRODUCTION

Madhya Pradesh has been plac
second among all States in mineral pr
duction. The State accounted for 22 p
cent of the main minerals produced
the country during 1989-90. Last ye
the State produced minerals worth abo
Rs. 1.636 crores which was Rs. 1
crores more than the producti
achieved in the preceding year, acco
ing to the State Mineral Resour
Department. During 1989-90,
department suffered a fall to the ex
of Rs. 11.50 crores in its revenue f
lowing the Madhya Pradesh Hi
Court's Judgement that the State Go
ernment did not have the right to c
lect cess for mineral production.

EDTA
EDTA
EDTA
EDTA
EDTA
AND
IT'S
SALTS
MFRS:
SONY CHEMICALS
1/2 DARSHAN UDYOG BHAVAN, SAFED PUL,
M.V. ROAD BOMBAY - 400 072
PHONES: 5120926/5120713/5136822
GRAM: NEWGENER TELEX: 011-72398 SOC IN

# Creation of gas pool account opposed

The Petroleum and Chemicals Minis- has opposed the creation of a gas ol account recommended by the lkar Committee for crediting the dif- ence between the price allowed to the ducers and the consumers.

Instead, the Ministry has suggested t there should be only a single price ich should be allowed to the produc- since the actual cost of gas produc- n is much higher than that ommended by the Kelkar Commit- and there would be no extra eco- mic gains or rent accruals.

The ministry has argued that the basis which the Kelkar Committee has culated the gas price, suffers from veral defects. First, the committee has en into account the cost of gas pro- ced from only one gas field — South ssein. This was taken as Rs. 1,714 1,000 cubic metres and the long run erage cost (LRAC) worked out as . 1,450 per 1,000 cubic metres.

But, according to the Petroleum and emicals Ministry, the cost of produc- n from mid and south Tapti fields, ich is Rs. 3,300 per 1,000 cubic tres, should also be taken into count. Moreover, the calculation uld be made on the basis of the long marginal cost (LRMC) and not AC.

Secondly, the committee has wrongly calculated the burden of corporate tax on the producers as 40 per cent. The actual corporate tax works out to 43.2 per cent which makes a difference of about Rs. 50 per 1,000 cubic metres.

Thirdly, the loss suffered by the producers due to fluctuations in the exchange rate have not been included in the prices recommended by the committee. This works out to Rs. 200 per 1,000 cubic metres.

Fourthly, very large investments amounting to several thousand-crore rupees are planned to be made in the facilities for development and transportation of gas in the country during the next few years which call for adequate rate of return for the companies making these investments.

While the Kelkar Committee recommended the gas price on the basis of replacement value of imported fuel oil, the ministry wants that the price of gas should be fixed on the basis of the replacement value between naphtha and high speed diesel.

The ministry has thus suggested the price of natural gas to be fixed at Rs. 2,500 per 1,000 cubic metres exclusive of all taxes and duties. The Kelkar Committee had recommended a consumer price of Rs. 1,600 per 1,000 cubic metres in the first year to be increased in stages to Rs. 2,000 per 1,000 cubic metres in the third year and a producer price of Rs. 1,500 per 1,000 cubic metres.

The ministry has suggested that the new price should be applicable from the first year to the producers and that there should be no distinction between the producer price and the consumer price for being credited to the gas pool account.

The ministry has also pointed out that the cost of transportation of gas along the H-B-J gas pipeline is Rs. 1,219 per 1,000 cubic metres while the committee has allowed only Rs. 850 per 1,000 cubic metres.

The Petroleum Ministry is against the narrowing of the bands of calorific value of gas recommended by the Kelkar Committee. The narrowing of the bonds will lead to higher costs and make administration more difficult, it was argued.

## MRL SIGNS MoU

Madras Refineries Ltd. has signed a memorandum of understanding with the Union Minsitry of Petroleum, under which it will be entitled to various kinds of assistance from the Union Government.

ATTENTION PHARMACEUTICAL MANUFACTURERS AND DEALERS

**WHY PAY MORE?**

**NOW - BRONOPOL B.P. (2-Bromo-2-Nitro Propane 1,3-Diol)**

**(A Broad Spectrum Preservative)**

Available at attractive prices; Guaranteed quality; Assured deliveries.

Manufactured by

**THIRUMALA PHARMA CHEM PVT. LTD.**

83, SIDCO Industrial Estate, Ambattur, Madras 600 098.
Phone No.: 653518

**ASK FOR FREE SAMPLES AND PRICE**
**(REQUIRED DEALERS FOR UNREPRESENTED AREAS)**

# Imported items ready for RPL gas turbine plant

Reliance Petrochemicals Limited has imported components worth $10.5 million for a gas turbine plant from the Netherlands. Its plans for the power sector appear to have been received as with all Reliance projects. They were postponed temporarily when the V.P. Singh Government came into office. Now all signals are green.

Reliance Petrochemicals Limited is positioned to increase the capacity to 20 or 50 mw, since it is possible to set up gas turbine generators in stages. The original proposal to set up a 20 mw generating capacity captive to the RPL gas cracker went up to 60 mw on the recommendation on August 16 last year of the Industrial Credit and Investment Corporation of India.

That increased thereafter to 100 mw, a full fledged power plant. Given that more than 70 million cubic metres of gas will be produced daily from the western offshore region, the capacity could easily be increased to 500.

The project is to be at Hazira, based on free and associated gas from the western offshore fields. It will supply power to the Gujarat Government. The users will be the neigbouring industries in the Hazira-Baroda area. There can be great economies, including those of scale, in the transmission and the losses would be low.

Reliance Petrochemicals has been given to understand by the Gujarat Government that this power plant may operate at very high plant load factors, should that even entail cutbacks in the Electricity Board's own generating capacity.

More important are private assurances received by the Ambanis on the tariffs that will apply to the electricity that this plant generates. They are confident that these will be sufficiently remunerative to justify the investment. Depreciation for such projects has to be completed in seven years. For the Ambanis to commit themselves to this investment, they would need such an assurance, though informal, from the Union Ministry of Power.

Forty per cent of the funding is expected to come from the institutional consortium led by ICICI. The earlier leasing arrangement, temporarily abandoned, is also likely to be revived. That included ICICI, IFCI, SBI Cap and Canfina.

---

## NEW GAS PRICING NORMS UNJUST: GCCI

The new formula for gas pricing as recommended by the Kelkar committee is not only unscientific and arbitrary, but unjust and unfair for the industrial growth of the state, according to the Gujarat Chamber of Commerce and Industry (GCCI).

In a detailed memorandum submitted recently to the Union Petroleum and Chemicals Ministry, the GCCI has pointed out that the gas prices fixed on the basis of thermal equivalence of fuel oil was unfair. It was consistent with the prices prevailing in Europe, where gas is transported over a long distance.

The Oil and Natural Gas Commission (ONGC) was demanding from the industrial consumers in Baroda Rs. 2,503 per 1000 cubic metres of gas since 1982 which was contrary to the government notification in this regard following the Supreme Court's decision, the memorandum said.

The discriminatory demands of Oil and Natural Gas Commission was bound to result in the closure of nearly 20 industrial units in and around Baroda, rendering more than 30,000 workers unemployed which could hardly be viewed with equanim according to the memorandum.

The GCCI memorandum furt stated that Gujarat was entitled to n ural benefits of low cost fuel found its territory, just as benefits of coal we available to Bengal and Bihar and t of hydro-power to Maharashtra a Karnataka. The ONGC should ta public interest into account and shou not act as a super monopolist in respe of gas pricing, it stated.

It advocated that Gujarat was against any other state using the found in its territory but certainly des that it's requirements should be met fi and on priority basis as it has no oth cheaper sources of energy. The GC urged the government to give necessa sanctions to Pipavav, besides Gandh gas based power station, to enable s ficient power generation in the state meet the rising demand.

---

## NO MOVE TO SUPPLY LPG THROUGH PIPELINES

The Government ruled out in the L Sabha on August 28 any proposal supplying LPG through pipelines.

Replying to a question by Mr. Ph Chand Verma, the Petroleum and N ural Gas Minister, Mr: M.S. Gurup aswamy, said, however, natural gas being supplied as a domestic fuel Baroda, Bharuch-Ankleshwar, Sibsag Duliajan and Moran.

Commitments of natural gas had a been made for city supply schemes Agartala, Bombay and Surat. Feasi ity studies for supplying natural gas some other cities were being conduc by Gas Authority of India Limi (GAIL).

He said GAIL had underta techno-economic feasibility studies the assistance of Sofragaz of France respect of Bombay and British Gas respect to Delhi.

# Positive US and Soviet response to oil supply

The External Affairs Minister, Ir. I.K. Gujral, informed Parliament on ugust 23 that the response from both he USSR and the US on the possibility of India getting oil supplies at reaonable prices has been "generally ncouraging".

Making a suo motu statement in both Iouses of Parliament, at the conclusion f his visit to Moscow and Washington, esides Amman, Bagdad and Kuwait, e said while the US favoured an ncrease in oil production by producers n the Gulf and elsewhere so that the verall shortfall and its adverse effect n the prices and availability could be ninimised, the USSR immediately greed that it would seek alternative ources for the supplies which had itherto originated in Iraq.

He said the USSR would welcome a elegation from India to work out the etails of its proposals imediately. The oviets have also offered to sell oil, ut India would need to examine the ffer.

He said even though the escalation of ension and conflict in the Gulf may ave serious repercussions, India does not propose to play a mediatory role. He eferred to the decision of Pakistan and Bangladesh to send their troops to the Gulf region and expressed apprehension hat this may be used as an excuse for urther militarisation of the two counries. He felt that defusion of tension in he Gulf was needed urgently, a fact which he had stressed upon in the ourse of his seven-day tour.

He said India was considering the possibility of sending a shipload of food to Kuwait to alleviate the suffering of people including Indians there. He said the Red Crescent and the Red Cross could also do so.

There were about 172,000 Indians in Kuwait and a total of 1.2 million Indians in the Gulf as a whole. Although the law and order situation in Kuwait was not normal, there was no cause for grave anxiety.

Property of a few Indians had been looted, but the authorities had brought this problem under control. Power, water and other essential services were functioning normally. Emergency medical facilities were available, but food shortage has appeared, making rationing inevitable. Almost all shops are closed, except cooperatives selling essential goods.

## STOCKS PLUNGE ON WORLD MARKETS, OIL PRICES SOAR

Share markets around the globe plunged while oil prices soared and the dollar retreated because of fears that the war of words in the Gulf could soon turn into fighting.

The world's three biggest stock exchanges — Tokyo, London and Wall Street — touched 1990 lows, sold down by investors who fear that, whatever happens in the Gulf, the economic outlook is grim.

Oil prices climbed to their highest levels for eight years because of concern that the Gulf conflict would choke off crude supplies to the industrialised world's economy. The dollar, which has enjoyed sporadic support as a safe place to invest in times of trouble, hit a new low against the German mark.

Gold benefited only marginally, rising just $3.50 to close in London at $413.75 an ounce. From Tokyo to London and Frankfurt to New York, the indices that track the health of shares pointed down, pausing only for brief bursts of bargain hunting before heading lower again.

## IPCL DECLARES Rs. 18.6- CROR DIVIDEND

Indian Petrochemicals Corporatio Ltd. (IPCL) has declared dividend o Rs. 18.6 crores on its paid-up share capital of Rs. 186 crores for the year endin March 31 last, the sixth year in succession. A decision in this regard was take at the 21st annual general meeting of the IPCL at Baroda on August 27. The IPCL achieved a sales turnover o Rs. 1,179 crores, registering an increase of 14 per cent over the previous yea and thus earning a gross profit o Rs. 217 crores and net profit of Rs. 96 crores, an Indian Petrochemicals Corporation Ltd. release said.

Indian Petrochemicals Corporation Ltd., which has mechanically completed the Maharashtra gas cracker complex at Nagothane in Maharashtra, has also received a letter of intent from the Government to set up a Rs. 2,665 crores integrated gas-based petrochemical complex at Gandhar in Gujarat. It has also made a significant achievement in terms of crystallisation of a joint venture with General Electric Plastics, B V of the Netherlands, the manufacture of advanced engineering plastics in India.

## FACT CAPROLACTAM UNIT PRODUCES CYCLOHEXANONE

The second important stage in the commissioning of the Rs. 315 crore ammonium sulphate caprolactam project of the Fertilisers and Chemicals Travancore Ltd. (FACT), a Government of India enterprise, has been completed by the successful production of cyclohexanone (Alone) on August 8 according to a press release.

The purity of the product has been achieved to the acceptable levels. The first important stage was the production of cyclohexanone on June 17, this year. Alone and cyclohexanone are the main input raw materials for caprolactam.

ASSAM GAS CRACKER PROJECT

# MacNeill & Magor awaits Govt. response

MacNeill and Magor Ltd., which has shown interest in the proposed Assam gas cracker project, is awaiting the Assam Government's response. There is no question of MacNeill and Magor washing its hands off the Assam Gas Cracker project, according to Mr. B.M. Khaitan, chairman of the company.

Speaking at a news conference at Calcutta recently, Mr. Khaitan said his information was that the Assam government would constitute a committee to study the offers received from industrial houses for participation in the project. It was too early to discuss the funding pattern and the debt-equity norms because the Assam Government had first to decide on the product-mix.

Mr. L.C. Jain, Planning Commission member, who is in charge of coordinating industrial development programmes for Assam, had strongly recommended the setting up of a gas cracker project in that state. This would ensure fruitful utilisation of natural gas available aplenty there. This really made the project an attractive proposition.

In defference to the wishes of the Assam government that established tea companies operating there should take part in the state's industrialisation programme, the MacNeill and Magor group which has a strong presence in the tea industry there through the decades had evinced interest in the gas cracker project.

## BOMBAY GAS USE: MAHARASHTRA READY FOR JOINT SECTOR PARTICIPATION

The Maharashtra Government will consider participation in the joint sector to utilise the associated gas from the Bombay High, according to the Chief Minister, Mr. Sharad Pawar. The State Government will also welcome prop sals from the private sector to bring th gas onshore for processing and use. will take up viable proposals with th Centre for approval, he has said.

Speaking as the chief guest at th 154th annual general meeting of th Bombay Chamber of Commerce an Industry held at Bombay on August 2 Mr. Pawar said that to meet the increa ing requirements of trained manpow in the petrochemicals sector, the Sta Government is thinking of setting up a institute of petrochemical technolog

## IOC ORDER FOR BHEL UNIT

The industrial power products div sion of the Tiruchi BHEL has secured Rs. 94.25-crore turnkey order fro Indian Oil Corporation, Baroda. Thi order includes design, manufacture, su ply, erection and commissioning of tw waste heat recovery boilers. This orde is to be completed within 22 month according to a BHEL spokesman.

C D FOUNDATION TRUST

AWARDS FOR 1989

Submissions are invited from individuals, universities, research organisations and technologists from organisations for outstanding achievements in the following fields of textiles:

1. **TECHNOLOGY RESEARCH/DEVELOPMENTS PERTAINING TO ALL ASPECTS OF MECHANICAL, CHEMICAL PROCESSING OF TEXTILES — AND ALSO INDUSTRIAL ENGINEERING AND OPERATIONS RESEARCH RELATED TO TEXTILE INDUSTRY RESULTING IN SAVING TO THE INDUSTRY.**

i) for submissions received from Research Organisations & Universities (One Award of Rs. 10,000/-)

ii) for submissions received from Technologists working in Industry (One Award of Rs. 10,000/-)

2. **PUBLISHED RESEARCH WORK DURING 1989 PERTAINING TO:**
(Synthesis, Manufacture, Physicochemical or Chemical studies etc. connected with Fibres, Dyestuffs or Textile Auxiliaries (One Award of Rs. 3,000)

Submissions (which contain full details regarding processes and products developed for) on chemical processing of textile fibres, yarns and fabrics made from cotton, wool, silk, synthetics and their blends or products and which have made positive contributions to the textile industry will only be considered. It is essential that the contributions should have made definite impact on the textile industry in India.

Nine copies of submissions supported by appropriate evidence may be sent to:

C D FOUNDATION TRUST

Kamani Chambers, Ground Floor, 32, R. Kamani Marg, Ballard Estate, Bombay 400 038.

**LAST DATE FOR RECEIVING SUBMISSIONS WILL BE 30TH SEPTEMBER 1990**

# anghi Polyesters to set up PFY project

Sanghi Polyesters Ltd. a company moted by Sanghi group of industries, derabad is setting up a project to nufacture 15,000 TPA of polyester ment yarn near Hyderabad in Ranga ddy District in Andhra Pradesh, at a st of Rs. 153 crores.

Sanghi group consists of the largest lependent textile process house in lia, leading manufacturer of non-tallic zip fasteners, PVC leather oth, PVC film, sheet BOPP & PVC es etc., polypropylene yarn, fibre, at resistant rubber thread units with cellent track record. The group has own from a company to a conglomate in last ten years. The project will first of its kind to manufacture polster filament yarn by direct melt sping system in South India.

The PFY project will be commisned in early April 1991 by starting ip spinning, taking advantage of early livery. Direct melt spinning plant will commissioned in August 1991. The mpany proposes to manufacture vars speciality yarns like high count, trial, thick and thin, cationic dyeable . and quality POY. It is planned to crease the capacity of the plant subquently to 25,000 TPAS.

The company received offers for chnical know-how and collaboration om various leading companies from r Eastern countries including Japan, d European countries. After due techcal and economical consideration, the mpany entered into collaboration with /s. Kohap Ltd., South Korea. M/s. hap Ltd. is one of the largest manacturer and exporter of polyester filent yarn to Japan and various other untries world over. Korea has now ertaken Japan in terms of quality and antity in production of PFY. Prices of Korean polyester filament yarn are lowest in the world, because of their w conversion cost. The company will t the benefit of low conversion cost om this collaboration.

M/s. Kohap Ltd. covers almost all lustrial sectors ranging from manufacture of synthetic yarn, PTA, exportation of textile industrial facilities and plants. Kohap is also engaged in high-tech fields as telecommunications, genetic engineering, substitute fuel, petrochemical products etc. The company opted for producer technology of M/s. Kohap Ltd., which is time tested. The project cost with Kohap technology is less by 15 to 20 per cent than that of plants being set-up by other promoters, providing higher profitability and low break-even.

The company has also gone, for the first time in India, for automatic winding machines, which further adds to the savings in cost and better quality with less wastage. The project cost of Rs. 153 crores will be financed by equity capital of Rs. 51 crores, foreign currency term loan of Rs. 27.13 crores and rupee term loan of Rs. 84.87 crores from financial institutions. The commercial production is scheduled to commence by the third quarter of 1991.

The domestic demand for polyester filament yarn has grown at high rate from 70,000 TPA in 1986 to 1,80,000 TPA for the year 1989-90. With high demand for quality products, fashion garments, upholstery and for other innovative applications, Sanghi Polyesters enjoys a large and growing market for its quality, speciality products. The promoter group is known for its achievements and innovative ways of project, and for its meticulousness in advancing to time schedules and cost. It believes in high quality, low cost products.

The promoters have excellent industrial and business background and have successfully created a place for themselves within a short period of 10 years, in the industrial circle. Their valued clientele extends from small individual powerlooms to large apex coop. handloom societies at state and national levels and also large business, trading and export houses.

REQUIRED

LARGE QUANTITY OF

ANTHRACITE

FOR

WATER TREATMENT PLANTS
1.2 - 2.5 MM EFFECTIVE SIZE,
SUITABLE FOR POTABLE WATER

Interested parties may contact

BOX NO. 1266

CHEMICAL WEEKLY
306, Shri Hanuman Industrial Estate,
G.D. Ambekar Road,
Wadala,
Bombay 400 031.

**ATTENTION:**
**MANUFACTURER/FORMULATORS**

**Pharmaceutical raw materials available with Modvat benefits at competitive price**

- **Acid Citric BP 80**
- **Analgin IP**
- **Aerosil 200 (Degussa)**
- **Aminophylline BP**
- **Cetostearyl Alcohol (Henkel)**
- **Glycerine Refined**
- **Icthammol USSRP**
- **Kollidon 30 (Polyvinyl Pyrrolidone BASF)**
- **Lactose 200 Mesh BP (Holland)**
- **L-Lysine Mono HCl BP/USP**
- **Lactic Acid BP/IP**
- **Propylene Glycol USP**
- **PVPK 30**
- **TMP IP**

Contact Direct Importers:

**M/s. LALCHAND BHIMRAJ**

11, Nyniappa Naick Street,
Madras 600 003.

**Phone: 564424, 564582**
**Resi.: 583455**
**Telegram: IODOFORM**
**Telex No.: 041-7756 AKE IN**
**Attention: Mr. Prakash**

ENQUIRY FOR OTHER PHARMACEUTICAL RAW MATERIAL INVITED
and
WE ARE INTERESTED IN C & F AGENCY FOR BULK DRUGS AND CHEMICALS

# FRG knowhow for Finolex PVC resin project

Finolex Pipes Ltd. is setting up a Rs. 352 crore project to manufacture 100,000 TPA of PVC resin, in technical collaboration with a subsidiary of Hoechst AG of West Germany, at Ranpar, near Ratnagiri in Maharashtra.

Uhde Gmbh, a wholly-owned subsidiary of Hoechst AG, will be responsible for the basic engineering to be deployed in the Finolex project, while Uhde India Ltd. Bombay, a subsidiary of Uhde GmbH, will look after detailed engineering and project management.

On completion the project is expected to take care of the entire captive consumption of polyvinyl chloride (PVC) of its pipe unit as well as of Finolex Cables Ltd. The two together are expected to account for about 40,000 TPA of PVC by 1993-94, while the balance of 60,000 TPA of PVC will be sold in the open market.

Currently, 200,000 TPA of PVC is being imported into the country. The D.V. Kapoor committee on perspective planning for petrochemicals, set up by the Planning Commission, estimated the middle level demand for PVC at 485,000 TPA in 1994-95 and 713,000 TPA by 2000. Based on the existing installed capacity in the country, estimated at 150,000 TPA and letters of intent issued by the centre, the demand-supply gap in 1994-95 would be about 135,000 TPA of PVC.

It is expected that the project will commence trial runs in around 30 months from the zero date, which is February 10, 1990. The company will capitalise interest on a project cost of Rs. 352 crore, which works out to Rs. 32 crore till 1993, according to Mr. P.P. Chhabria, chairman of the company.

During 1994, the first full year after the completion of the project, the company envisages a turnover of Rs. 310 crore, including that of its pipe division To part finance the PVC resin project the company will enter the capital market with an issue of 79.30 lakh — 14 per cent secured redeemable convertible debentures of Rs. 150 each for cash at par, aggregating Rs. 118.95 crore. Out of these, 10,73,333 convertible debentures (CDs) (Rs. 16.10 crore) are being offered on a preferential basis to the debenture holders of Finolex Pipes Ltd. 10.40 lakh CDs (Rs. 15.40 crore) to the shareholders of Finolex Cables Ltd., 6,66,667 CDs (Rs. 10 crore) to NRIs, 6.50 lakh CDs (Rs. 9.75 crore) to financial institutions/mutual funds 5,33,333 CDs (Rs. 8 crore) to the employees of the company and the balance of 39,66,667 CDs (Rs. 59.50 crore) to the public the issue is scheduled to open on September 19.

Besides, the company is also issuing 27,36,667 CDs (Rs. 41.05 crore) to its shareholders on a rights basis in the ratio of 25 CDs for every 100 equity shares held on the record date, September 4 1990.

Each debenture of Rs. 150 will consist of part A and B. Part 'A' of Rs. 60 will be converted into four shares at price of Rs. 15 per share at the end o 18 months from the date of allotment Part 'B' of Rs. 90 will be redeemed a the expiry of the ninth year from the date of allotment. Only 25 per cent o the face value of the debentures will be payable on application and another 25 per cent on allotment, while the balance will be on call, to be made only afte the ICICI, the monitoring institution gives a clearance for the use of funds already collected.

At present, the Chhabrias hold 65 pe cent equity. After the conversion o debentures, they will maintain a 39 pe cent stake.

# Small paper units told to devise anti-pollution kits

aper mills, especially the small ones e been urged to set up microproces- based and other low cost technol- in controlling pollution. igurating the zonal seminar on latest elopments in chemical recovery of ll pulp and paper mills and "utili- on of waste paper for pulp and paper duction" conducted by the Indian ) and Paper Technology Association Coimbatore on August 25, Mr. P.R. nakrishnan, Chairman, Madras minium, pointed out that the ACC ient plant at Madukkarai near Coim- ore has adopted micro-process for hods in pollution control.

le also urged the paper mills and nologists to formulate schemes for reduction in operation and for effi- t use of raw materials in an orga- d manner. Mr. K.G. Rangan, ident, IPPTA, made a plea for the lition of customs duty on import of te paper and also reduction of duty he import of modern machinery to used for recovery of chemicals in er mills.

e estimated that about 45 lakh ies of paper should be produced in country by 2000 as against 17.5 lakh ies now being manufactured. He ted out that as Government forest cy is against use of trees the indus- has to necessarily go in for waste er which is economical.

e suggested that Government and ate sector should help in organising ection of waste paper and classify as the present unorganised manner lts in admixture of unwanted mater- In this connection he pointed out Germany is utilising 36 per cent of e paper for production of pulp after d war II and has increased the rate. UK is using more than 60 per cent aste paper, Japan more than 47 per and the US 50 per cent for pulp arations.

The US and other countries are levying taxes for not utilising a minimum rate of wastepaper to discourage the use of other than waste paper recycling. He urged that similar legislation be enacted to take to more use of waste paper in pulp production.

## ACID FUME SCRUBBER

A simpler and effluent conservative device called "plate scrubber" has been introduced in the market for applications of acid fume scrubbing in fume extraction systems for steel pickling lines and other processes.

The plate scrubber is provided in all PVC/FRP material of construction and therefore, is completely corrosion resistant. The scrubber, air pollution control device, generates relatively much smaller water effluent and, therefore, saves on recurring effluent treatment generation costs.

The plate scrubber has been designed specifically for higher contaminant scrubbing efficiency. It is being manufactured in the country in technical collaboration with Ledge Engineering Inc., Canada.

For details contact: SK Systems Private Limited, 510, Hemkunt House, 6, Rajendra Place, New Delhi 110 008.

## PRICE EQUALISATION FUND FOR PETROL RULED OUT

There is no proposal under Government's consideration to create a price equalisation fund to have uniform prices of petrol and petroleum products all over the country, the Minister of Petroleum and Chemicals, Mr. M.S. Gurupadaswamy, told the Rajya Sabha on August 27 in a written reply to Dr. Yelamanchili Sivaji.

FOR YOUR REQUIREMENTS OF

**Hydrofluoric Acid**
**Ammonium Bifluoride**
**Sodium Fluoride**
**and**
**Other Fluorine Chemicals**

Contact Manufacturers

**MADRAS FLUORINE PRIVATE LTD**

No. 83, Kamraj Avenue
Adyar, Madras 600 020
**Phones: 413829/410188 Gram: MAFLUORIDE**
**Telex: 041 7654 MFPL IN**

**OUR AGENTS AT CALCUTTA**
**Harman Dyes & Chemicals**

No. 22, Rabindra Sarani
FN-21, 1st Floor, Calcutta 700 073
**Phones: 26-1406/27-9123**

V.V.Trans
Investments
Private Limited
ANNOUCEMENT
EXCELLENCE
THROUGH
QUALITY
V. V. TRANS
Investments
Private Limited
ANNOUNCES
WITH PRIDE
THE COMMISSIONING
OF THEIR PLANT FOR
THE MANUFACTURE OF
CHLORINATED
PARAFFIN
WAX
(HNP / WAX BASED -
DIFFERENT GRADE)
FOR YOUR REQUIREMENTS
DEALERS/ACTUAL USERS
PLEASE CONTACT
M/s. V.V. TRANS
INVESTMENT
PRIVATE LIMITED
R.O. 43/262, New Sankalbagh
Narasinga Rao Pet,
Kurnool -- (A.P.)
Telephone: 21381
Telex: 0815-216

# Once on oasis, now a poison tank

What was once an oasis in the parched Aravali Hills has today turned into a poison tank, because of effluents from a factory contaminating groundwater resources. A majority of wells in the Bichhri village in Rajasthan have been polluted by chemicals which seeped in from the collected sludge from a chemical factory.

Repeated directions from the Environment Ministry and the Supreme Court have not stopped the factory owners from dumping effluents and polluting the only source of water supply for the villagers. Studies have revealed the presence of carcinogenic aromatic organic compounds in the water which they affirm have come from the neighbouring factory.

According to the Centre for Science and Environment, which stood in the forefront of the movement against the factory, full grown mango and guava trees dried up when some villagers tried using this water for irrigation.

The Supreme Court after hearing arguments from the villagers and the industrialist on December 11, 1989, ordered that the Director of the National Environmental Engineering Research Institute (NEERI) undertake a study and report to the court. Meanwhile, it ordered the State Government to provide drinking water to the villagers

NEERI in its report while confirming pollution made a startling revelation that the sludge was being dumped just outside the factory premises. Presence of poisonous organic matter was found in the adjacent children's playground in March this year, the SC ordered removal of the sludge, watering of polluted rivers and provision of drinking water by the industrialist.

The Environment Ministry which remained a non-representative respondent in the case was apprised of the development by EPSC. However, the Minister of State for Environment a Forests, Mrs. Maneka Gandhi, using powers of the Union Government un the Environment Protection Act ash the State Government to remove sludge failing which the Central Pol tion Control Board would carry out task.

The sludge remained. It was in M the industrialist in an affidavit clain that he had sold the sludge to a cem factory and thereby lost authority remove it. In August, the factory another affidavit claimed that the f tory's effluent plants were function well and no substances were being c charged. Torn between the differ orders and exploitation of loophole the law by expert lawyers employed the factory owner, the people of Bich continue to suffer.

---

## SYNTHETICS AND CHEMICA HIKES DIVIDEND

Synthetics and Chemicals Ltd. hiked its dividend to 25 per cent for year ended March 31, 1990 on improved turnover of Rs. 140.36 cr (Rs. 120.47 crores).

The profit margin has, howe declined to Rs. 6.79 crores as comp to Rs. 8.48 crores in the previous on a turnover of Rs. 8.48 crores.

After providing Rs. 1.36 crores depreciation as compared to Rs. crores previously and a tax provisio Rs. 1.59 crores as compared to Rs. crores previously — the net profit down substantially to Rs. 3.84 cror against Rs. 6.30 crores in the prev corresponding period.

The company has written Rs. 3.91 crores as being provision longer required including provisio purchase tax of Rs. 3.75 crores inc ing substantially the amount avai for appropriation.

E ON ENVIRONMENTS MINISTRY

# Only major projects need clearance

The Union Cabinet has decided to tail and restrict the role of the Minis- of Environment and Forests in order accelerate developmental projects. cording to highly-placed soures, me- m projects covering an area of up to 000 hectares will now be exempted m clearance on environmental ac- unt. This leaves a narrow list of major jects, exceeding coverage of 10,000 ctares, which would hereafter be re- red to seek the Ministry's clearance.

With this decision, many project proposals having been put into cold stor- e on account of being environmental- unsound, would now be reopened. e final clearances would have to be ught from the respective ministries ly. Informed sources point out that s also shelves the Minister of State, s. Maneka Gandhi's recent proposal bring projects lower than Rs. 5 crores seek clearance from the Ministry.

In fact, experts feel that with Ms. ndhi having been sidelined and the ion Minister for Environment and rests, Mr. Nilamani Routray, still ding his bearings, political heavy- eights from other Ministries have ken advantage of the present impasse. e story doing the rounds is that the cisi[illegible] part of an orchestrated plan to curb any opposition to the several irrigation and power projects falling in this category.

It is learnt that the proposal for setting up a system of statutory impact assessments for granting clearances would also not see the light of the day. A paper on this was initiated by Ms. Gandhi in December and was believed to be in the final stages of clearance by the Committee of Secretaries.

The idea behind impact assessments was that instead of projects coming to the Environments Ministry at random, each would be dealt with at the blueprint stage in each Ministry. Efforts are on to clearly undermine the importance of this Ministry in relation to the others, say senior officials. "A sleepy Ministry which had catapulted into the limelight recently with Maneka at the helm would now fade into oblivion once again."

Informed sources cite the manner in which the all-powerful tourism and hotel lobby won the battle on construction along the beaches, shocking the environmentalists. All the steps taken by the Ministry earlier to curb the pollution of beaches through indiscriminate construction, would be reversed. Officials indicate that the Ministry is sitting pretty without a whimper of protest, while its wings are being clipped.

A list of projects which fall in the category not requiring clearance is being drawn up. The list would include the 'Disneyland' project near Sohna in Haryana (including 4800 hectares in 24 villages). The launching of the Aravalli afforestation project had created some apprehension. It would obtain final clearance in all likelihood now.

## MOST STATES SET UP POLLUTION CONTROL CELLS

All the States except Nagaland and Arunachal Pradesh have taken steps for implementing the environmental laws by setting up State pollution control boards. Stating this in a written answer in the Lok Sabha on August 27, the Environment and Forests Minister Mr. Nilamani Routray, said the Central Pollution Control Board has initiated steps to set up a joint board for both the States under Section 13 of the Water (Prevention and Control) of Pollution Act 1974 The Centre has approached the north eastern council for taking on the functions of the State board for Nagaland. He said 3160 cases under the Water (Prevention and Control of Pollution) Act, 1974 and 830 cases under the Air (Prevention and Control of Pollution) Act, 1981 have been filed.

AVAILABLE IN BULK & SMALL PACKING

SULPHURIC ACID 98% & 70%
DILUTE NITRIC ACID 58%
CHLOROSULPHONIC ACID
ALUMINA SULPHATE
FERRIC/IRON FREE

Please Contact:

SDBB CHEMICALS (INDIA)

Head Office.
Satnarayan House,
Section 17, Ulhasnagar 421 003
Phones: 78238/75992/70096

Branch Office:
Ganga Jamuna Cinema Bldg.,
Tardeo, Bombay 400 007
Phones: 4922970/4944606

# Kerala monazite beaches 'cause radiation risk'

The Centre for Industrial Safety and Environmental Concerns, a Quilon-based non-Governmental research group, has disputed the Union Minister of State for Science and Technology, Prof. M.G.K. Menon's claim that no radiation effects on the population was seen in the monazite beaches of Kerala in any statistically significant manner.

The Minister had made the statement in the Rajya Sabha in reply to a question on August 7. In a statement at Quilon on August 25, the centre said a 30-month long study undertaken by it along the monazite beaches of Quilon district showed that the incidence of several mutable diseases was higher among the exposed population.

The study was taken up by the centre against the background of the 'deliberate inaction' on the part of the Bhabha Atomic Research Centre (BARC) in taking up a detailed study in the area as suggested by the World Health Organisation. The Centre said as early as in 1957 WHO had identified the people of this area as the most suitable population for a study for yielding valuable information on radiation-caused genetic disorders. By the end of the sixties, BARC conducted an ad hoc demographic survey which showed a higher infant mortality rate among the surveyed population.

A team of the All India Institute of Medical Sciences (AIIMS), consisting of Dr. N. Kochu Pillai, Dr. V. Ramalingasamy and others also found in a study that there were 12 cases of Downs syndrome in a population of 12,000 in the monazite beaches as against none in an Alleppey village without the radiation effect.

They also observed a higher rate mental retardation and chromosc aberrations among the exposed peo The centre said the AIIMS team prepared a detailed project proposal more elaborate study. BARC was s posed to meet half the cost of the stu but it withdrew from the venture la BARC, which still held a virtual mo poly over all radiation research, refused to undertake the study for last three decades.

It was against this background 'deliberate inaction and cover-up' the centre for industrial safety undert the 30-month study, it said.

Referring to Prof. Menon's statem that the centre for industrial safety not submitted any report to the ex committee appointed by the Ministr Environment and Forests, it said the liminary report of the study presented at a symposium organise the All India Institute of Medical Sc ces and the United States Environme Protection Agency in May 1990. Minister of State for Environment, Maneka Gandhi, who inaugurated symposium, had made specific re ence to the study and had requestec participants to discuss the find threadbare.

The centre said that considering social implications of the findings a local, national and even global lev had sought a meeting with Prof. M and Ms. Maneka Gandhi in March through its president, Justice Krishna Iyer, retired judge of Supreme Court. The response fro Ministries was 'not at all positi added.

Holding that the Kerala study r reveal 'a near accurate picture' c genetic risk due to radiation, the c said if Prof. Menon was sincerely ested in knowing what exactly we in this narrow coastal strip, his M try should consider a national deb this issue.

A TRUSTED & PROVEN NAME
TO MEET YOUR REQUIREMENTS OF
SEQUESTERING/CHELATING AGENTS

EDTA

EDTA PURE ACID
EDTA DI SODIUM
EDTA TETRA SODIUM
EDTA TETRA SOLUTION
EDTA FERRIC SODIUM
EDTA FERRIC AMMONIUM
NTA

Contact Manufacturers

New Alliance Dye.Chem.Pvt.Ltd.

Office:
C/o. P.V. Kamat & Co.
12, Khandelwal Bhavan,
166, Dr. D.N. Road, Bombay 400 001.
Phone: 2040024

Factory:
K-63, M.I.D.C. Tarapur,
Post-Boisar, Dt. Thane.
Pin: 401 506

### FFLUENT TREATMENT PLANTS

# Environment Ministry offers to arrange credit

The Union Environment Ministry has ffered to arrange for loans to private nd public sector firms willing to set up ffluent treatment plants at their factory omplexes. The centre has prepared a st of about 350 industries against hom action will be taken if they do not nstall ETPs within a stipulated time-rame.

Following the centre's directive to ese units, firms manufacturing pollu-ion control equipment have geared up heir advertising and sales promotion. Most of the companies manufacture quipment to treat industrial organic ffluents and are now planning to come ut with machines to treat inorganic vaste also.

Since the centre has made it manda-ory for the 350 units and upcoming pro-ects to install the ETPs, the firms have trengthened their research and deve-opment wings and are on the look out or foreign collaborators to upgrade heir technology.

Among the ETP-manufacturing units, Western Paques (India) Limited has aken the lead with its anaerobic efflu-ent treatment process. The anaerobic, as pposed to aerobic process is used to reat organic waste only. The process lso helps generate methane gas for use s an energy source in the factory.

The process was first evolved by Paques B V of the Netherlands which is owned by the airline KLM, and is suited o various industries like distilleries, ulp and paper, food processing and everages.

WPIL, which has entered into a tech-nical knowhow and assistance agree-ment with Paques B V, will supply its ETPs on a turnkey basis using the upflow anaerobic sludge blanket pro-cess. The company will also instal its anaerobic effluent treatment plants based on the biopaq system which will be located at sites near the clients' companies.

Under such agreements, the plant will be owned and managed or leased out by WPIL and the gas generated by it will be supplied to the client. The company has already entered into such an agreement with Sanjivini Sahakari Sakhar Karkhana Limited, a sugar cooperative in Maharashtra. The company is also negotiating with other prospective users for manufacture and erection of ETPs. Each plant will cost between Rs. 1 and Rs. 3 crores.

WPIL, which will enter the capital market with a public issue of 35 lakh equity shares of Rs. 10 each for cash at par, has been promoted by Western India Industries Limited — the flagshi company of the Western India grou —and Paques B V.

WPIL is a profit-making dividend paying company which is primaril engaged in executing turnkey project in the field of fire protection, wate engineering and pollution control.

The issue, which will open on Sep-tember 10, will raise funds to par finance an ETP-manufacturing unit i Ahmednagar district of Maharashtr which is being built at a cost of Rs. 753 lakh. WPIL already has orders worth Rs. 10 crore in hand.

---

## BPCL SIGNS MoU

Bharat Petroleum Corporation Limited (BPCL), a public sector undertaking, had signed a memorandum of understanding with the Petroleum Ministry on August 22 for the current financial year.

Unitop
SURFACTANTS

NONIONICS
ETHYLENE OXIDE CONDENSATES
OF
NONYL PHENOL, OCTYL PHENOL,
FATTY ACIDS, ALCHOHOLS, AMINES
USED AS
WETTING AGENTS, EMULSIFIERS, LEVELING AGENTS
SOLUBILISERS, CLEANING AIDS

WE ALSO OFFER
SPIN FINISHES
DETERGENTS
CORROSION INHIBITORS
DEMULSIFIERS
DEFOAMERS
DISPERSING AGENTS
ANTICAKING AGENTS
DEGREASING AGENTS
LEVELING AGENTS
CONING OILS
ANTISTATIC AGENTS
AGRO EMULSIFIERS

CONTACT MANUFACTURERS
UNITOP
CHEMICALS PRIVATE LIMITED
Factory: A-18, M.I.D.C. PATALGANGA, RAIGAD DIST TEL: 317
Sales Office: 34-35, ISLAM BUILDING, 46, VEER NARIMAN ROAD
OPP AKBARALLYS, BOMBAY-400 023
TEL: 204 8406, 204 6906, 512 5077, 512 5409, TELEX: 011-3654 TPPL
SHARE OUR EXPERIENCE & KNOWLEDGE OF SURFACTANTS

ERRIC OXIDE MANUFACTURE

# NMDC's pilot plant opened

The crucial step towards becoming an exporter of electronic materials was achieved with the inauguration on August 25 of a pilot plant for manufacturing ferric oxide. The Rs. 1.7-crore plant at the National Mineral Development Corporation's R & D Centre in Hyderabad is a joint venture with the Department of Electronics which has funded 50 per cent of the cost while technical assistance has come from UNDP/UNIDO.

Using blue dust, the high-grade iron-ore ultra fines from the Bailadila mines which have so far been discarded as waste, the pilot plant will make 2,000 tonnes of ferric oxide annually to provide bulk samples to ferrite manufacturers in India and abroad. Already an 18-tonne sample has been sent to Japan at 130 a tonne against the international price of 180 and NMDC chairman and managing director P.C. Gupta said inquiries have been received from the US, China, Singapore and East Europe.

The pilot plant will pave the way for a 50,000-tonne capacity commercial unit to be set up in Visakhapatnam in two to three years when NMDC proposes to capture 20 per cent of the global market, Mr. Gupta disclosed.

Also in the pipeline is a 10,000-tonne plant for making ultra-pure ferric oxide for use in very high quality ferrites. Most of the production will be earmarked for export. The cost of production is estimated to be less than a third of the international price for the commodity. Pointing out that the country's electronics target for the Eighth Plan could not be met unless we produce our own materials. Mr. Gupta called on the ferrite industry to participate in these ventures which would ensure raw materials of consistent high quality.

Inaugurating the pilot plant, Secretary of the Department of Electronics Mr. N. Vittal said the biggest handicap for the electronics industry was that most of the special materials needed as raw materials had to be imported, making their cost two to three times higher than in other countries. There is a substantial technology gap in the country which DoE is seeking to fill through a programme of establishing pilot plants for selected materials.

In the case of Ferrite India, it is an insignificant producer with output of hard ferrites just about 5,000 tonnes last year valued at Rs. 18.75 crores and soft ferrites less than 12.00 tonnes valued at Rs. 11 crores. This compares with global production of hard ferrites at 2.5 lakh tonnes and soft ferrite of one lakh tonnes. Mr. Vittal said world demand was expected to touch a combined total of 6.4 lakh tonnes by 2000.

Given this background the DoE secretary said it was vital that India took immediate measures to ensure that we become a global player in electronic materials. This could be done by setting up large-scale plants like the one planned — by NMDC at Visakhapatnam which would enable domestic industry to expand production and more important to allow high value added exports.

At present installed capacity for hard ferrites used in communication devices, high-density magnetic recording media and magnetic optic memory devices is just half of the licensed capacity of 14,100 tonnes. In the case of soft ferrites which are used in recording/erase heads for audio, video and computer tapes, TV components etc., the installed capacity is even lower at 2,200 tonnes against the licensed capacity of 8,200 tonnes.

Mr. Vittal said the main drawbacks the country suffered from was the scattered and widely varying capacities to take many manufacturers, the limite potential of the domestic market an inconsistent quality of the indigenou raw material. However, with the worl market growing at six per cent annuall and a number of manufacturers with drawing from ferrite manufacture ther were ample opportunities for India t become a major exporter.

## VIZAG NAPHTHA CRACKER: DOWNSTREAM PROJECTS UNDER STUDY

The Government is considering sanctioning downstream projects from the naphtha cracker plant to be set up a Vizag, the Petroleum and Chemical Minister, Mr. M.S. Gurupadaswamy said in the Rajya Sabha on August 27

Answering supplementaries durin question hour, the Minister said that th Government has a positive approac and will be deciding on the right project mix. Mr. Gurupadaswamy tol Mr. P.R. Kalvala that a letter of inten has been issued for the cracker projec to UB Petrochemicals Ltd. on Octobe 13 last year for the Rs. 1,100-crore project.

The company would make its ow arrangements for implementation of th project including its funding and exac location, he said. Two-thirds of th naphtha to be used by the project woul be available from the refinery at Viza itself. The Government is considerin to use the Hazira-Bijaipur-Jagdishpu (HBJ) gas pipeline for a petrochemica project in Uttar Pradesh to be execute by Gas Authority of India Ltd.

## DRUG INDUSTRY ARREARS

Nearly 100 drug companies owe th Government Rs. 175 crores under th Drugs (Prices Control) Order 1973 an the Government is doing everything t expeditiously recover the money, th Petroleum and Chemicals Ministe Mr. M.S. Gurupadaswamy, told th Rajya Sabha on August 27.

# Small scale units identified for SIDBI scheme

Nine clusters of industries in the mall-scale sector have been identified y the Small Industries Development ank of India (SIDBI) for intensive vork on supporting modernisation and echnology upgradation. Work has ommenced in respect of the lock indusry in Dindigul, Tamil Nadu, and texile dyeing and printing industry in ajasthan, according to Mr. R.S. Agarval, SIDBI's managing director.

This scheme has been launched in the vake of a large backlog in modernisaion and technology obsolescence, vhich often led to sickness in small cale units. A concerted effort is being nade with regard to selected industrial lusters.

Mr. Agarwal, who was in Madras ecently, said SIDBI had introduced a scheme for direct discounting of bills to ssist small units in the goods sector and a scheme for rediscounting of trade bills arising out of sale of products from the small scale sector. It was also proposed o provide factoring services to mitigate he woes of delayed payment.

To encourage exports, the bank was xtending interest subsidy to exporting nits in the small scale sector. A special fund with an initial corpus of Rs. 5 crores had been created to extend equity support to women entrepreneurs and another fund for Rs. 3 crores to help voluntary organisations engaged in welfare and uplift of women.

Pointing to procedural problems in promoting women entrepreneurs, Mr. Agarwal noted that while defining a women's enterprise, the Government had stipulated that at least 50% women should be employed in such ventures.

To support new units in rural and semi-urban areas, the National Equity Fund scheme, which provided equity support to new units in such areas, had been extended to State Financial Corporations, private sector banks and select cooperative banks as well.

## SAIL PLANTS INCUR Rs. 872 CRORE LOSS IN FOUR YEARS

SAIL plants have suffered a production loss of Rs. 872.50 crores during the last four years because of power shortage and trippings. In terms of quantity, the loss comes to 11.2 lakh tonnes of finished steel. The period taken into account is from 1986-87 to 1989-90, covering the plants at Bhilai, Durgapur, Rourkela, Bokaro and Burnpur (IISCO).

The Minister for Steel and Mines, Mr. Dinesh Goswami, who gave this information to the Rajya Sabha, said in 1989-90 alone the SAIL plants had suffered a production loss of around 1.7 lakh tonnes valued at Rs. 173.52 crore During 1989-90, Bokaro suffered maximum loss of 1.18 lakh tonne valued at Rs. 120.53 crores. He said th Steel Ministry was in constant touc with the Department of Power so tha remedial measures could be taken t rectify operational constraints on a day to-day basis. Besides, certain long-ter measures had been initiated to strengthen the grid support to the steel plant and also to improve their captive powe capacities, Mr. Goswami added.

## PVD PLAST

PVD Plast has achieved commendable working results during the second half of the year ended June '90. Sales including other income has gone up to Rs. 15.88 crore compared with Rs. 7.88 crore for the corresponding period of the previous year. Gross profit before depreciation was placed at Rs. 87.10 lakhs as against Rs. 42.37 lakhs during the corresponding period of previous year.

*For Your Requirements Of:*

**REACTIVE DYES**
**REMAZOL DYES**
**RAPID FAST DYES**
**RAPIDOGENS**
**RAPID FAST SALTS**
**SODIUM BISULPHATE**
**POTASSIUM BISULPHATE**

**Please contact manufacturers:**

**TIME CHEMICALS PVT. LTD.**

"HARI-ICHHA"
A-23/92, Rajawadi Co-Op Housing Society,
Rajawadi, Bombay 400 077
**Telephone No. Off.: 5121709**
**Resi.: 5123597/5121246**

AVI

UNDS FOR IPRS

## Move to raise cess on steel, pig iron

The Commerce Ministry has initiated a move to raise cess on steel and pig ron to mop up funds for international price reimbursement scheme (IPRS). The Ministry also proposes to slap cess on a few more steel items like stainless steel and alloy steel.

The existing rates of cess are Rs. 200 per tonne on steel and Rs. 75 per tonne on pig iron. There is no cess levied on stainless and alloy steel. It is now proposed to raise the cess on steel to Rs. 350, on pig iron to Rs. 150 and on new items to around Rs. 100 per tonne.

The rise in the rates is expected to mop up about Rs. 350 crores for disbursements to engineering goods exporters under IPRS. The need for more funds under the scheme has arisen following the hike in engineering goods exports target for 1990-91 to Rs. 3,400 crores from Rs. 3,100 crores. In fact, the engineering goods export has been rising at a fast pace while the cess rates were kept at the same level. As a result, there had always been paucity of funds resulting in delay in payments to the exporters.

The funds for IPRS come only from one source, i.e. cess on steel and pig iron. However, since cess rates were not raised proportionately with increase in exports, the Commerce Ministry bridged the gap by making funds available on an ad hoc basis from the market development assistance (MDA) scheme. This was later repaid to the Ministry after the money was collected from the cess.

The increase in cess rates would hence help the engineering exporters to a large extent. The Engineering Export Promotion Council (EEPC) has been urging the need for increase in cess for several years now. It is believed that the Commerce Minister, Mr. Arun Nehru is taking a personal interest in the issue and is also favourably inclined towards the increase.

However, the move is facing stiff opposition from the Steel Ministry which is against any further increase in steel prices in the domestic market.

The Commerce Ministry on the other hand has argued that the steel price hike effected by the Steel Ministry actually results in compounding the IPRS problems.

Under IPRS the exporters are reimbursed the differential between the international and domestic prices. The increase in steel prices in the domestic market means that more funds are to be made available for disbursements under IPRS. The domestic prices are about 60 to 250 per cent higher than the international market depending on the product.

AVAILABLE

FEED ADDITIVES

DL-METHIONINE
DINITOLMIDE BP
FURAZOLIDONE IP
L-LYSINE MONO HYDROCHLORIDE

Best Quality

Prepared from selected Raw-Materials, Perfectly Standardised,
Passed through rigid control tests of uniform superior quality
Available in attractive & Protective packings
at competitive rates

CONTACT :

V. Tribhovandas

Ranvir Mansion
66/70, Shamaldas Gandhi Marg, Bombay-400 002.
Gram : IODOFORM Phones : 317209/318716/318821
TELEX : 1182812-VT IN

### GRANITE PUT IN EXPORT PROMOTION LIST

Granite has been included in the list of areas identified by the government for making a special thrust in the overseas markets.

Exports of cut granite blocks and granite polished slab and tiles have been growing steadily in recent years.

Exports have more than doubled from Rs. 53.3 crores in 1984-85 to Rs. 120 crores in 1988-89 and the upward trend is continuing.

Granite exports were valued a Rs. 51.4 crores in 1985-86, Rs. 60.4 crores in 1986-87 and Rs. 90 crores in 1987-88. There is considerable scope for expanding exports of this item, especially in West Europe an official release in New Delhi said.

## SPOTLIGHT ON

# Biotechnology & Life Sciences (Part 1)

### NEW LOW-COST BIOTECH ROUTE FOR L-ALANINE FROM JAPAN

Mitsubishi Petrochemical has ecently unveiled a new low-cost route or commercial production of L-alanine mino acid from fumaric acid using ungi.

The Company plans to commercialze production in Japan in 1990. Costs could be as low as one-third of convenional enzymatic processes. The key to he new process are two fungi Brevibacterium flavom and Pseudomonas dacunhae, which contain high concenrations of the enzyme aspartase and spartate-B decarboxylase respectively.

L-alanine is involved in the human netabolism as a nitrogen carrier. High process costs around 3000-5000 yens in Japan, have restricted its use in intravenous solutions.

This new biotech method of producion will cut the price to as little as 1000 yens/kg, opening up new opportunities or its use as food additive in intravenous alimentation.

### INSULIN PRODUCED IN PLANT LEAVES

Researchers at the South Korean Institute of Science & Technology claim o have produced gamma-DNA insulin n tobacco leaves. So for only three previous cases of animal protein production n higher plants have been recorded in he science world.

Researchers report that insulin manufacture by this method, if successful in uture will considerably reduce the cost of the product. The Institute is also nvestigating the possibility of insulin production in tomatoes. (*SRC-Bulletin* April-May 1990, p. 85).

### BIOPOLYMER RESEARCH SPAWNS NEW BIODEGRADABLE PLASTICS

Researchers at ICI Biological Products have recently introduced a new biodegradable polymer 'polyhydroxy butyrate-hydroxyvalerate (PHBV)'. This new polymer is reported to be totally biodegradable and made from non-fossil renewable resource. This biodegradable plastic comes on the heels of Warner Lambert Company's discovery of a degradable polymer made from corn starch.

The new technology of PHBV according ICI researchers involves the feeding of glucose to a bacterium Alcaligenes eutrophus. The bacterium transforms glucose into a hydroxy butyric hydroxy valeric co-polymer. These C4 and C5 chains closely resemble a well known degradable polymer, polylactic acid used in making medical sutures.

Much research is under progress and if the current rate of technical advance is sustained, PHBV will be the first of a whole family of biodegradable polymers with a wide range of physical properties and potential applications.

PHBV in the first instance will be used in bottles. However, it has one short-coming. Products with alcohol in them do not have proper shelf-life when bottled in the new plastic. However, PHBV can be used in bottles for packing food items and cosmetic products not containing alcohol. Another hurdle facing PHBV is its high price at $15 a pound. However, the company is confident of lowering the price to $7.50/lb by increasing its capacity.

Besides bottles PHBV can also be used to make films and fibres, the company reports. Degradable plastic utensils is another possibly future market.

Competition is growing to PHB Warner Lambert came out with its bio degradable polymer Novon last Januar (1989). This product made almos entirely from starch is still in its development stage, however, with no commercial use at present.

Both the above two polymers underline a growing trend towards biopolymer research emphasizing degradables Exxon may be the next company to stick its foot in the landfill as it is funding research at the Univ of Massachusetts, (Amberst), into plastic producing bacteria.

A polymer from hydroxyalkanose acid similar to the ICI product is reported to have been discovered there. These can be formed into thermoplastic like elastomers and appear to degrade into carbon dioxide and water. (*CMR* 4/30/90, p. 36).

### BIO-CELLULOSE PROVES SUPERIOR TO WOOD PULP

For the first time, a cellulose is being produced by bacteria in commercial quantities report process developers Wayerhaeuser Co. (Tacoma, Wash) and Cetus Corp (Emeryville, Calif). The product, Cellulon, consists of an intricately cross linked fibre network (rather than fibres of measurable length common to other forms of cellulose) and its fibre are about 0.1 micrometer wide (vs about 30 micrometers for softwood pulp fibres).

As a result, Cellulon has 200-times more surface area than wood fibres, making it useful in binding, thickening and coating applications at very low concentrations, says Weyerhaeuser. The fibre is made in an agitated fermenter, using a specially developed strain of Acetobacter bacterium in a medium containing glucose, salts, corn steep liquor and iron chelators. Yields are in excess of 0.2 gm of cellulose per gm of glucose. After fermentation, the mixture of cellulose and bacteria cells is purified; the bacteria are destroyed by both caustic, then the cellulose is washed and dewatered on 2m-wide belt presses. (*Chem Eng* 6/1990, p. 17)

## WORLD'S BIOLOGICAL DIVERSITY AT STAKE

According to conservative estimates there are about 4 million living plants and animals, with merely 1.4 million i.e. about one-third, of the whole known to science. The rest are strangers to science. If one were to go by radical estimates which place the actual number of living organisms at a mind boggling figure of 35 million then we know of less than 5% of these organisms.

India is richly gifted with about 5% of the world's biodiversity, and is probably home to over 2 lakh plants and animals. This of course, does not take into account microorganisms, for which sadly enough there are no estimates. With the homogenisation of habitats, population pressure etc. many organisms — a large number of which are still unrecorded — are being pushed to extinction. (TOI 7/8/90, Sunday Review)

## A NEW RESEARCH SCALE MINI-FERMENTOR MARKETED IN THE UK

B. Braun Medical (UK) has recently launched the Biotab CP Mini fermenter system. The system is versatile and economic, and is ideal for most low-volume lab requirements.

The Biotab CP is computer compatible, unlike previous models, which only allowed data logging. The oxygen system is still primarily galvanic, but there is now an upgrade kit to permit polarographic operations. The new system has been developed to be completely compatible with existing British systems. Culture vessels are available for working volumes from 300 ml to 5 lits and are single walled or jacketed with flat or rounded bases. The top plate incorporates interchangeable shafts and 12 threaded ports to allow flexibility in the choice of instrumentation and control. A dual sampling is provided for simple sterile sampling and for innoculation.

This stirrer system is driven by a powerful motor to ensure stability, even with high viscosity culture broths. The speed is continuously adjustable between 100 and 1,200 rpm, the speed being displayed on the control unit. Other modulus cover dissolved oxygen control and measurement, pH control and measurement, and temperature control and monitoring. (*Educ In Chem* 3/1990, p. 57).

## WORLDWIDE ENVIRONMENTAL BENEFITS WILL FLOW FROM NATURAL GAS USE

The next 10 years, according to Australian Gas Association should see natural gas playing a major part in the protection of the environment. Natural gas is the cleanest of all fossil fuels and makes the least contribution to the greenhouse effect of any fossil energy form. The direct use of in the home, commercial buildings and in industry will ensure the minimum pollution of the atmosphere.

In addition the work being done the world over to develop natural gas as a transport fuel could lead to significant improvements in the amount of low level pollution. The development of natural gas as a transport fuel can be the best stop-gap measure before hydrogen or electricity operated vehicles are developed. (*Australian Science & Technology Newsletters*, 5/1990, p. 1).

## BIOTECH RESEARCHERS PROMISE CUSTOMISED DAIRY CATTLE

Dairy cattle that produce lean beef containing less saturated fat, cows produce milk better suited to hu infants and cows that produce pha ceuticals are each one step close to ity at a ranch near Houston (Texas USA. Four genetically-enginee calves born over the past 16 months, the first transgenic bovines in the w created by biotech researchers.

A team of scientists including B O'Malley, a biologist at the Baylor C lege of Medicine and Ken Bondrol Granada Bio Sciences (a world lea in producing cloned dairy ca embryos), a subsidiary of Gra Corp, a cattle breeding and food co pany, developed the modified calv The research team is about mid-wa their research project of 10 years,

The first transformed calf born March 1989, contains a human oes gen receptor gene that the rese hoped would accelerate growth by c ing the cow to use its own oestro more efficiently. Bondroli told The N York Times, however, that the calf yet grown no faster than other ca Two other calves born in Septem 1989 and March 1990, have an e copy of a bovine gene that produ 'insulin-like growth factor'. The sci ists expect the extra growth factor help to generate more muscle tissue therefore enhance meat productio

In December 1989, the fourth ca female, was born with an extra cop the gene that produces bovine gro hormone. Biotech companies pro the same hormone in bacteria. hope to sell it to dairy farmers who increase milk production by inject into cows. These plans have ignit major controversy in both Europe USA. Some scientists believe the mones may harm the cows. The T researchers, who hope that their ge ically engineered cow will show hi milk production, may be able to cir vent the consumers' complaints. 'A rently, these are normal, healthy, h cows' reports O'Malley. Recently

…was opened a laboratory in
…ottingham, to supply the
…sting Board with cloned
…ew Sc. 6/23/90, p. 27).

## …EDIATION POISED …LOSIVE GROWTH IN

…diation — the use of
… dispose of waste — is
…xplosive growth in USA in
… The US market for biore…
…e expected to rise to around
…n by 2000 AD. The recent
…mediation of Hazardous and
…Wastes estimates that this
…urrently worth $100 million,
…assessment services, treat-
…nocular nutrient sales.

…d by the US Chemical con-
…p, Falmouth Associates of
…lame, the report states that
…treating waste by bioremed-
…n average $50-80/ton com-
… $250-650/ton for incinera-
…0/ton or more for landfills
…his technique is said to be
… a wide range of chemical
…and metal wastes.

… some 250 ton/year of haz-
…tes are produced by 14,000
…lants. Around 80% of this is
… on landfills. These figures
…de an estimated 20,000 sites
… been contaminated over the
…ears and abandoned, nor
… problem, the report notes
…tion is seen as having a
…le in this sector, because of
… innocuous end-products
…y."

… bioremediation is reported
… used successfully in clear-
… of the oil slick left by the
… supertanker, Mega Borg,
…oded in the Gulf of Mexico
… In this project around 45
…bia were spread over a 9.4
…he oil slick.( ECN 7/2/90).

## DU PONT UNVEILS WORLD'S BIGGEST PLAN FOR PRODUCING OZONE DEPLETING ALTERNATIVES TO CFCs

Du Pont recently announced its big plan to build commercial scale plants for three non-ozone depleting alternatives to CFCs. This announcement was made at the 2nd meeting on Montreal Protocol held in London last June. The new hydrofluoroalkane plants would be capable of producing more than 60,000 ton/year of HFC134a 152a and 125. The plants could supply most worldwide refrigeration needs to the end of the century.

Plants to produce HFC134a, the widely accepted alternative to refrigerant CFC12 are planned for Corpus Christi (Texas), Louiseville (Kentucky), Dordiecht (Holland) and Chiba (Japan). HFCs 152a and 125, targeted for use in blends in dehumidifiers and air-conditioning chillers will be produced at the US sites. The plants should become operational between 1991 and 1995.

Du Pont has put on hold further investment in commercial scale plants for hydrochlorofluorocarbon alternatives including HCFCs 123, 141b and 142b at sites in USA, Canada, Europe and Japan, following the moves in USA Congress to have HCFCs phased out by 2,015. The company is looking for a phase out date of 2030. The ozone depletion and global warming potential of primary alternatives have reported refer Table 1.

HFC 134a is a front runner as replacement for CFC-12 in refrigeration and air-conditioning applications. Both Du Pont and ICI are well advanced with commercial scale plants scheduled to be onstream early in 1991. Several other companies such as Allied Signal (New York), Atochem (France), Rhone Poulenc (France) and Showa Denko (Japan) have finalized plans for the commercial production of HFC-134a in future. Toxicity and environmental impact testing programmes are sufficiently advanced to allow initial sales of HFC-134a to industrial applications.

Among hydrochlorofluorocarbons (HCFCs) the HCFC-141b and HCFC-123 are second and third primary alternatives. As many as six companies (including Du Pont) have active plans to manufacture HCFC-141b in future. For HCFC-123 only 4 companies including Du Pont have finalized plans to manufacture this alternative.

Table 1
Ozone depletion and global warming potential of primary alternatives

| | Ozone depletion potential* | Global warming potential* |
|---|---|---|
| **HFCs** | | |
| 125 ($CHF_2CF_3$) | 0 | 58.0 |
| 134a ($CH_2FCF_3$) | 0 | 27.0 |
| 152a ($CH_3CHF_2$) | 0 | [illegible] |
| **HCFC** | | |
| 22 ($CHClF_2$) | 5 | [illegible] |
| 123 ($CHCl_2CF_3$) | 2 | [illegible] |
| 124 ($CHClFCF_3$) | 2 | [illegible] |
| 141b ($CH_3CCl_2F$) | [illegible] | [illegible] |
| 142b ($CH_3CClF_2$) | [illegible] | [illegible] |

* Percentage of CFC11

Even if all CFC production and usage end tomorrow, it would take the best part of a century for the chlorine levels to fall to 2 ppb (the pre-ozone hole level), because of the long life times of CFCs in the atmosphere.

By comparison, the HCFC have much shorter lifetime and their effect on the ozone layer would be minimal —a price well worth paying, reports. Du Pont. Atochem expresses it another way: 10 years of HCFC use would not contribute more than non-adhesion to the protocol of a single developing country with 50 million inhabitants (0.2 ppb in each case). Du Pont, therefore has focused much of its alternatives development efforts on the HCFCs (*ECN* 7/2/90, pp. 6-7).

## NEW DEVELOPMENTS IN BIO-ELECTRONICS ON THE HORIZON

As the limits of silicon chips are being approached for computers, research is being carried out into the possibility of building electronic chips, virtually molecule by molecule, using the technology of bioengineering to prototyping and mass production.

This is the subject of a Frost & Sullivan report on 'Bioelectronics', a Technology Impact Report'. This report also looks at the broader field of molecular electronics.

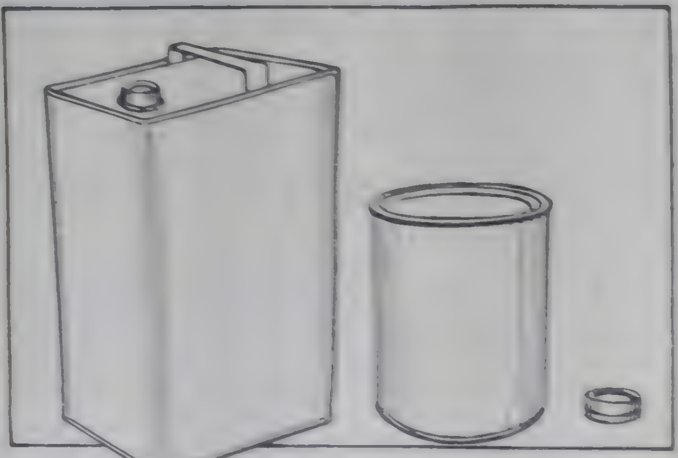
The ultimate bioelectronics fantasy would have genetically engineered cells churning out microscopic protein computers. But in fact, not only has no molecular scale device been built, there are also doubts at present about the market for such alternative electronics.

Despite its theoretical limitation, conventional technology is advancing so quickly that 'biochips' will be hard pressed to overtake them in the foreseeable future. More likely, viable biocomputers would fill a niche, where is weak, computing in artificial gence applications. In any case, bi is likely to remain in academic prise for years to come.

Bioelectronics' great success date is biosensors which exploit th ity of individual proteins to gen signal in the presence of certai stances. Since proteins are unstabl sensors are typically dispo Self-generating biosensors are po but the added costs and complexit only make sense in process c industry applications.

Other potential biosensor applic foreseen by Frost & Sullivan i measurement of Biological O Demand (BOD), the evaluation o ronmental contaminants such as cides and monitoring for evide biological or chemical warfare. ( *& Sullivan's Report on 'Biosen A Technology Impact Review').*

TIN CONTAINERS



MFGS.

- Round & Rectangular Cans
- P.P. Caps & Neuman Caps
- Advt. Metal Posters
- Components & Drum seals

卐 SWASTIK INDUSTRIES

34-C, Thakker Building, Ground Floor, Gala No. 4, Champsi Bhimji Rd., Next
to Shrinivas Bldg., New Post Office, Old Anjirwadi Mazagaon,
Bombay-400 010. Ph: 8729366.

YOUR PROFITS ARE LEAKING ...... WE CAN SEAL THEM

CHAMPION

"CHAMPION" BRAND ASBESTOS PACKINGS & JOINTINGS FOR STEAM, HYDRAULICS, ACIDS, ALKALIES, OILS & GASES. 100% PTFE/TEFLON SHEETS, RODS, TAPES, ROPE GASKETS & BRAIDED PACKINGS, ENVELOPE GASKETS, MOULDED & MACHINE PARTS. BLUE/WHITE ASBESTOS BRAIDED PACKINGS IMPREGNATED WITH PTFE/TEFLON. "SPITMAAN" RANGE OF NON-ASBESTOS GLAND PACKINGS FOR TOUGHEST SEALING JOBS.

"PLUS-GAS-INDIA" A POWERFUL RANGE OF ANTI-CORROSION FLUIDS & TREATMENT COMPOUNDS MADE IN TECHNICAL COLLABORATION WITH U.K.

"CHARMINAR" ASBESTOS MILLBOARD GRADE M-574 (GENERAL PURPOSE) 1.5MM TO 12.5MM TH. & GRADE M-874 (SPECIAL PURPOSE) 0.5MM TO 1.5MM TH.

"SIRWO" BRAND COMMERCIAL, STEAM - AL OIL PROOF SYNTHETIC NEOPRENE & ELECTRIC RUBBER SHEETINGS & RUBBER INSERTIONS, HIGH PRESSURE STEAM JOINTINGS "KLINGERITE" NON-METALLIC & 1000-METALLIC GASKET SHEETS. "AVARC" GRAPHITE FLAKES, RED VULCANISED FIBRE SHEETS & RODS, 85% ASBESTOS MAGNESIA COMPOUND, HOLDTITE PASTE & LIQUID, RUSTOLENE, GRAPHITE POWDER, IRON CEMENT, "FLUXITE" SOLDERING PASTE, "INDIAN HEAD" GASKET SHELLAC COMPOUND & M-SEAL EPOXY COMPOUND, NYLON RODS & SHEETS

"CHAMPION" - A TRUSTED NAME IN ASBESTOS, RUBBER, PTFE / TEFLON PACKINGS & SEALS

SURENDRA TRADING CO.

129, Narayan Dhuru Street, Bombay 400 003. TEL.: 32 66 15, 34 89 18

SKF ADVANTAGE

NO. 1 QUALITY • FULL TECHNICAL ASSISTANCE • WIDEST RANGE • EFFICIENT DELIVERY

Genuine Bearings For All chemicals ☐ Fertilizer ☐ Petrochemical & Allied Industries

SKF Authorised Stockist Recognised Importer SIBCO Recognised Stockist

Purushottam Somabhai & Co.

SUPPLIERS OF BALL & ROLLER BEARINGS TO REPUTED INDUSTRIES ALL OVER INDIA

36, sarang street p.o. box no. 3014
bombay: 400 003

phones: office: 326252 ■ 327701 ■ 323217 ■ 341603
phone Resi: 4122353 ■ 4110288
gram: 'FORESIGHT'
telex: 11-76815 PSCO IN

PRINT-DESIGN

- * ACTIVATED ALUMINA BALLS, GRANULES & POWDER
- * MOLECULAR SIEVES TYPE 3A, 4A, 5A & 13X
- * ACTIVATED CARBON GRANULAR & POWDER
- * SILICA GEL WHITE & BLUE
- * SILICA GEL FABRIC BAGS
- * PRECIOUS METAL CATALYSTS & SALTS like Pd, Pt etc.

RASHMI DHABUWALA
(Authorised Signatory)

**R.V. CORPORATION**

9, Uttam Chambers, 39, Syed Mukri Street, Katha Bazar, Bombay 400 009.
Phones: 325440/341184 Resi.: 6366147 Gram: AMARJYOT, Bombay 400 009.

**RASHMI DHABUWALA has resigned as partner from**
**M/s. Catalysts & Chemicals, Bombay 400 056.**

TO MEET YOUR REQUIREMENTS OF

- **Monochloro Acetic Acid**
- **EDTA**

Contact Manufacturers

**SHREE KHODIYAR CHEMICALS**

Behind Juvansinghji Hospital, Bhavnagar 364 001.
Phone: 29117, 29661, (R) 26708, 28523
Plant Plot No.: 202/203 Bhavnagar-Rajkot Road, Sihor.

**PARAGON INTERNATIONAL**
Mfrs. of TIN SALTS as per IS 3026

TIN CHLORIDE * TIN OXIDE (Black & White)
TIN SULPHATE (Acid Tin Salt) * TIN STANNATE (Alkaline Tin Salt)

**POPATLAL JESHINGBHAI & CO.**

Importers of
LITHOPHONE RED SEAL 30% (Czechoslovakia)
POTASSIUM FERROCYANIDE (GDR) * RANGOLITE C (Czechoslovak
POLYETHYLENE WAX LE 253, HI WAX 4202E & WAX
for Plastic & Printing Inks. LE 114
MODVAT facility available for imported products

*Contact:*
Kabibai Trust Bldg., 14/16, Bhandari Street X Lane, Vadgadi, Bombay 400 003.
Phone: 326844/341985; Resi: 486378

# Food & Pharmaceutical Technology in Perspective

## WORKSHOP ON MICRO- E TECHNOLOGY

A in USA conducted a workshop icrowave Drying Technology in More than 100 FDA staff were a presentation by representatives ICI, TK Fielder and four US aceutical companies demonstrat e emergence of microwave tech- y in the pharmaceutical industry companies cited several incen- to convert to microwave drying more conventional methods

ower energy and manufacturing sts
orter processing times
reased yield because of reduced duct handling
hanced worker safety through dust ntrol provided by integrated anulator-dryers
mination of environmental variab- from the manufacturing process
creased floor space requirements
tomation of the granulating and ying processes

A is yet to evaluate the effects of wave heating on product safety rm Technology 5/1990, p. 38).

## LDWIDE MARKET FOR ERINARY VACCINES ED FOR GROWTH

al animal chemicals in USA teins, vitamins, minerals and — are predicted to grow in with the size of the US animal which is expected to increase by 3% annually for the 1990s. In ed animal vaccines are expected to at about 12% per year at good The USA today is the world's est producer of animal vaccines.

(USA) has recently garnered with the world's first truly genetically engineered animal vaccine called "PRV-Marker", which protects against pseudorabies in poultry. The product was formally introduced in March 1988 and now, according to the spokesman, has increased Syngro's market share from 20 per cent to 50 per cent versus Smith Kline & Beechem. Cyanamid also has a new vaccine introduced in September 1989 called "Presponse" which prevents shipping fever in cattle.

Technology Management Group in New Haven, Conn. reports that the worldwide market for veterinary vaccines will increase from $870 million in 1990 to $1.1 billion by the year 2000, assuming demand development in Eastern Europe, the USSR and other developing countries. According to this study there are at least 118 animal vaccines already on the market or in development among 218 companies and 132 research institutes worldwide. (*CMR*, 5/21/90, p. SR14).

## ALUMINIUM & HEALTH

We get our aluminium from the food we eat (89% approximately), the water we drink (10%) and the air we breathe (1%). Dried soybeans, tea and fruit juices all contain quite high levels of Al. Additives can be often responsible for extra Al in food. For example, there are high levels of Al in cake mixes where sodium aluminium phosphate is used as a raising agent.

It is also true that Al can get into food from cooking pans, especially with acidic foods. Therefore, it is unwise to use Al vessels with acidic foods. Al is also found in water. There are two ways Al gets into water: (a) In high acid rain areas, the Al which is present in clays and rocks is washed out. (b) Aluminium sulphate is a water treatment chemical used in some areas to remove impurities from the water at the water treatment plant.

Persons with weak kidneys are often susceputible to Alzheimer's disease, according to recent findings. As our kidneys can take care of most of the Al that we eat or drink, people with weak or damaged kidneys are more at risk than others. Premature babies can also receive too much Al. Especially if the baby is fed milk based on soybeans because their Al intake is much more than its kidneys can get rid off.

## SIMPLESSE (A PROTEIN-BASED FAT SUBSTITUTE) GETS GRAS STATUS FROM FDA IN USA

Simplesse, a low calorie protein-based fat substitute was introduced in January 1988 by the Nutrasweet Company (a subsidiary of Monsanto). In February 1990, the FDA in USA confirmed the GRAS (generally recognised as safe) status for Simplesse in frozen desserts. Simplesse is produced from milk and/or egg protein by an internationally patented heating and blending process called "microparticulation". As proteins are heated, they coagulate. Under ordinary conditions heat-coagulated proteins form large particles of gel which feel rough in the mouth.

Precise blending or shearing in the microparticulation process shapes the protein gel into spheroidal particles so small that the tongue perceives them as fluid rather than individual particles. Because the protein is shaped into tiny particles below the perceptual threshold of the tongue, the fat substitute has the richness and creaminess normally associated with fat.

Each gram of Simplesse, which is hydrated protein (1-1/3 Kcal/g), will replace one gram of fat (9 Kcal/g). Another way of stating this is that 1 g of protein and 2 g of $H_2O$ replace 3 g of fat; or 4 Kcal replaces 27 Kcal. In addition to frozen desserts, the fat substitute is expected to be used in other dairy products such as yogurt, cheese spread, cream cheese, and sour cream. It also has applications in oil-based products such as salad dressing, mayonnaise and margerine.

Because Simplesse is made from proteins, this fat substitute cannot be used in cooking oils or in food products that require frying or baking. The heat level in such applications would cause the ingredient to coagulate and lose its fat-like mouthfeel. (*Food Technology*, 3/1990, p. 92).

## INDIA'S FIRST COMMERCIAL FOOD IRRADIATION UNIT COMMISSIONED IN COCHIN, KERALA

India's first commercial food irradiation complex is to be commissioned in Cochin shortly. According to Dr. J.S. Pruthi, food technologist with the irradiation project, the unit will initially irradiate spices and later items like prawns, fish, onions and potatoes, mainly for exports.

The complex, which is being jointly set up by the BARC and the Spice Board is nearing completion. Cobalt-60 is the irradiating radio isotope to be used in the complex. Food irradiation is a process by which food products are exposed to gamma rays from a radioisotope to prevent microbial contamination, infestation by insects and sprouting. Irradiation also extends the shelf-life and allows the ripening process. (*Bev & Food World*, Jan./May 1990, p. 54).

## NEUTRACEUTICALS — FOODS ON VERGE OF BEING DRUGS

An entirely fresh new category is opening up for food companies abroad, particularly in advanced countries. Dr. Wrick of Arthur D Little calls it the 'food/drug interface'. But Dr. Stephen De Felice of the Foundation for Innovation in Medicine has a more succinct term 'Neutraceuticals'.

Neutraceuticals are food products in the brink of making health claims. They have inherent nutritional benefits but stop short of proclaiming their strengths for regulatory reasons. The Japanese —yes, the innovative Japanese — have been marketing Neutraceuticals for some time. One example is a clear juice drink with a day's supply of soluble fibre. Products more familiar to European consumers include, bran cereals, calcium supplement and fish oil capsules.

Thoughtful marketing and repositioning of some products can influence consumers to look at food products as 'nutritional insurance' rather than pills and supplements. In other words, eating bran cereals now is smarter than fighting high blood cholesterol later. According to Dr. Wrick, educated, enlightened consumers are more inclined to eat nutritious foods than gulp nutritional supplements. (*Food Eng. Intl.*, 3/1990, p. 9).

## A NEW SYNTHETIC FAT SUBSTITUTE IN USA UNDER TRADE NAME DDM

DDM — dialkyl dihexadecymalonate — a fatty alcohol ester of malonic acid and alkylmalonic acids, is being developed as a fat substitute for high temperature applications by Fritto-Lay Inc., 900 North Loop 12, Irving TX 75061 USA.

DDM has been used to produce potato and tortilla chips. Sensory panels, conducted for around one year, show that a blend of DDM and soybean oil used as a frying medium results in potato and tortilla chips that panelists report are equally as crisp as those fried in standard vegetable oils. Panelists also report that finished products made with DDM are less oily than those fried in regular vegetable oils.

The DDM soybean oil blend resul in a 33% reduction in calories and 60% reduction in fat. Feeding studi with rats show that the synthetic fat su stitute is minimally digested and th less than 0.1% is absorbed. Testing co tinues with the synthetic frying o while other non-nutritive DDM pr ducts are being evaluated in mayonnai and margerine type products. (*Foo Tech.*, 3/1990, p. 94).

## A NATURAL INGREDIENT DEVELOPED TO REPLACE MONOSODIUM GLUTAMATE (MSG)

A natural ingredient designed replace MSG in processed foods ha been recently introduced by Fries Fries (USA). The proprietary replace ment can be used in processed meat such as sausages, sauces for meat ar vegetables, seasonings, condiment gravies, soups and oriental foods.

It is offered in dry powder for which can be applied by mixing or ma inating, depending on the product. It stable in microwave ovens, freezing, h fills and retort. For further informatic contact: Fries & Friest, 1199, Edis Drive, Cincinnati, Ohio 45216.

## LOW LACTOSE BABY FOOD PROCESS DEVELOPED BY CFTRI

Low lactose baby foods are not ma ufactured in India at present. T CFTRI (Mysore) has recently report the development of a process for deve oping a low-lactose, milk based ba food, by enzyme processing of milk f feeding infants and children sufferi from primary lactose intolerance a lactose induced diarrhoea. Baby food this nature is not being manufactured India at present.

Inability to digest lactose, a natural occurring sugar in milk, arises in infa

ildren due to recurring diarrhoea,
ing in low lactase activity in intes-
mucosa of children. The CFTRI
lation is a milk based formulation.
ighly acceptable to infants. It does
ontain any soya as is prevalent in
nercially available products. The
ss can be adopted in existing dair-
ith facility for spray drying. The
inery and equipment needed are
available indigenously.

the manufacture of this baby
good quality milk is pasteurised
ne fat is stripped off to the desired
After processing the milk with
priate quality and quantity eval-
n, enzyme preparation together
other ingredients, like vitamins,
rals, salts etc are added.

e blend is then homogenised, con-
ated and spray-dried to get the
ed product. The readily reconstit-
e product is then packed in unit
iners under nitrogen. For further
nation contact: Director, CFTRI,
re 570 013, Karnataka.

## EW INDIGENOUS PROCESS REFINE CRUDE RICE BRAN

arat Edible Oils and Fats Ltd.,
bay, has developed a new cost-
tive process to refine crude rice
oil into an edible grade oil. The
process can refine crude rice bran
ining free fatty acid (FFA) up to

e new process based on molecular
lation, has undergone pilot tests in
Germany and has been found best
d to Indian conditions, where the
of crude rice bran oil is going up
%.

e new process apart from eliminat-
use of hexane and alcohol, has the
bility to refine any kind of high
oils into edible grade unlike the
ing processes. The new process is
pollution free, reduces the consumption of caustic soda by more than 80%, saves energy upto 70%, and operates at low capital costs.

## A ROBOTIC MILKMAID ON THE HORIZON

American scientists are now testing a robot that can milk cows. The mechanical milkmaid is equipped with electronic sensors to identify cows approach in the milking barn.

If a cow is due to be milked the door swings open and she is automatically presented the particular feed ration programmed for her. While she is feeding a brush covered device is automatically inserted between her hind legs to clean the udder. Once the brush retracts, the milking device pushes forward and attaches herself to the udder. Having already identified the cow, the milking robot adjusts the milking device to her test location.

The device detaches and retracts for automatic cleaning when it senses that the milking has been completed. Developed by a Dutch machinery company, the robotic milkmaid is not entirely without flaws. At a demonstration earlier this year, when a cow moved suddenly, the cups came off and the manager had to help the robot reattach itself. And part of one cow's udder remained unmilked when the robot retracted.

Maryland University has purchased North American research and development rights and is installing a unit in an experimental milking parlour it is building in Clarkville, USA.

## NEW CHEMICAL ENTITIES LAUNCHED WORLDWIDE IN 1989

In the past year 1989, 35 new chemical entities (NCEs) have been introduced in the market. (For this 35 NCEs refer Scrip Review Issue 1989, pp 14-15.) Japan was again throughout the 1980s, the country in which the greatest number of NCEs were introduced, with 12, followed by UK and USA with four each, France with three, W. Germany, Holland and Ireland with two each, and one each in Argentina, Denmark, Finland, New Zealand and Sweden.

The most popular therapeutic category was cardiovasculars with 12, followed by neurologicals (9), anti-cancers (3), gynaecologicals (3), anti-infectives (2) and dermatologicals (2). The breakthrough products among NCEs in 1989 include: Cetus' r-DNA interleukin-2 (proleukin) and Biogen's gamma-interferon. They are both novel forms of therapy, which were previously unavailable. Interleukin-2 also has the potential to treat a previously untreatable disorders, renal cell carcinoma.

Other significant NCEs included Merell Dow's enoximone, the first cardiac stimulant which inhibits phosphodiesterase activity and the world's first aldose reductase inhibitor, Wyeth-Ayersl's tolrestat for diabetic neuropathy: Other noteworthy NCEs included (a) Astra's forscarnet sodium for CMV retinites, (b) the first once daily quinolone antibacterial lomefloxacin (c) Roussel Uclaf's abortifacient mifepristone and (d) Merrell's anti-epileptic, Vigabatrin. (*Scrip. Review Issue*, 1989, pp. 14-15).

## SHARK CREAMS FOR SKIN CARE DEVELOPED IN JAPAN

An ingredient of shark bile is the latest natural wonder product to find its way into skincare products via Japanese research. The new ingredient called "Isolutrol" is a Japanese discovery, which is reported to modify sebaceous gland activity to normalise sebum production and hence help oily skin as a cosmetic, but not specifically as an acne treatment. (*Mfg. Chemist*, 1/1990, p. 11).

Reliable Quality
Assured Supply

AMINO ETHYL PIPERAZINE (AEP)

APPLICATIONS :

☐ Epoxy Curing Agents ☐ Emulsifiers
☐ Corrosion Inhibitors ☐ Pharmaceuticals
☐ Asphalt Additives ☐ Surfactants

From the only manufacturers in India

**DIAMINES AND CHEMICALS LIMITED**
International Quality with Indigenous Ingenuity.

**Ahmedabad (H.O) :**
1, National Chambers,
Ashram Road,
Ahmedabad 380 009.
Phone : 409626, 405748.
Gram : DIAMINES

**Baroda (Works) :**
Plot No. 13,
P.O. Petrofils 391 347
Dist. Baroda.
Phone : 73305/406
Gram : DIAMINES
Telex : 0175 352 DACL IN

**Bombay Office :**
85, 'C' Wing Mittal Towers,
8th Floor, Nariman Point
Bombay - 400 021.
Phone : 2029507
Gram : CELAGAR

Navnit/213/9

We guard your Valuable Property...
... by strong walls of protection.

An outcome of the thorough study of the needs of industrial storage and packaging, by our team of experts, now JYOTI INDUSTRIES launches its new DRUM DIVISION.
The Drum Division manufactures H.D.P.E. blow moulded containers like Jerry Cans, rocket type Carboys and round barrels with narrow/wide mouths from 10 to 118 litres in various shapes. Our containers designed for strength and durability with [illegible]

**JYOTI Industries**
(drum division)
**Manufacturers of blow moulded H.D.P.E. containers upto 100 litres.**
**JERRY CANS, CARBOYS, DRUMS**
**OFFICE:** 34, Unique Industrial Estate (New), R.P. Road
Opp. Jawahar Cinema, Mulund (W), Bombay-400 080.
**Phone: 561 57 68, 560 29 68**
**WORKS:** Poona — Bombay Road Opp. Amrut Nagar, MUMBRA-400 612 (THANE)

For Your Requirements Of:

AMMONIUM MOLYBDATE (99.9% PURE) SODIUM MOLYBDATE (ASSAY 99%)

**CADMIUM** -- CHLORIDE/SULPHATE/CARBONATE/OXIDE/NITRATE
**BISMUTH** -- NITRATE/OXIDE/CITRATE/SUBCARBONATE/OXYCHLORIDE/SUBNITRATE
**COBALT** -- NITRATE/CARBONATE/ACETATE/CHLORIDE/SULPHATE/OXIDE/OXIDE BLACK
**NICKEL** -- CARBONATE/NITRATE/OXIDE/SULPHATE
**POTASSIUM** -- IODIDE/IODATE

**EDTA DI SODIUM SALT**

Contact Manufacturers

**MONARCH CHEMICAL INDUSTRIES**

Admn. Office: 25, Old Sattagali (Kaviniray Gali), Tarachand Ghanshyamdas Bldg.
1st Floor, Sheikh Memon Street, Bombay 400 002.
Phones: Office: 318998/319814 Resi: 8129380/8127641

WE OFFER YOU BEST QUALITY & COMPETITIVE RATES
IN TANKER LOAD AND DRUM PACKING

**N-BUTANOL**
**ETHYL ACETATE**
**TOLUENE**

**ACETIC ACID**
**BUTYL ACETATE**
**BENZENE**

**LAPE ALL GRADES**

*Authorised Dealers*

**M/s. OSWAL PETROCHEMICALS**
(A Unit of OSWAL AGRO MILLS LTD.)

Please Contact:

**SHREE VALLABH CHEMICAL CORPORATION**

349/353, Samuel Street, Indu Chambers, 4th Floor, Vadgadi, Bombay 400 003.
Dial: 325623, 344219

*Our Associates:* **KANTI TRADING CO.,** Bombay-3.

**OCTOATE * NAPHTHENATE DRIERS**
**LIQUID PVC STABILIZERS**

More than 15 years of production and supply experience to customers satisfaction all over Inida R & D Department always available to supply products tailor-made for the customer. Prompt delivery as per customers schedule.

Please Contact

aryavart

**LSO AT**

RICHUR : Vimla Bldg., Rice Bazar. Ph. 25878
AGPUR : Panchsheel Textile Traders, Ph. 32667
LHI : A.K. DUTT & CO. Ph. 738051
ALCUTTA : S. Mitra, Ph. 377028

**Aryavart Chemicals Pvt. Ltd.**

Post Box No. 33,
317 & 319 Arenja Corner, Plot No. 71,
Sector No. 17, D.B.C. Vashi,
New Bombay 400 705.
Tel.: (0215) 670384/671410
Gram: CHEMSFIELD, Vashi, New Bombay 400 703.

Now Available Regularly

BEST QUALITY

ORTHO DIANISIDINE BASE

(Fast Blue B Base)

*Export Enquiries Are Solicited*

CONTACT:

**P. G. Chemicals Pvt. Ltd.**

166, Nagdevi Street, Ismail Manzil, 1st Floor, Bombay 400 003

**Phones: 322303*342754**

---

AVAILABLE EX-STOCK WITH MODVAT BENEFITS

PROPYLENE GLYCOL USP -- DOW ARCO
AEROSIL 200 NF
POLYVINYL PYRROLIDONE
  P.V.P.-K 30/KOLLIDONE 30 USP
ETHYL CELLULOSE NF "ETHOCEL"
  GRADES: N-7, N-10, N-20/22, N-45/50, N200
MICROCRYSTALLINE CELLULOSE NF/USP "AVICEL"
  GRADES: AVICEL PH 101, AVICEL PH 102, RC 581/591
BUTYLATED HYDROXY ANISOLE (B.H.A.)
TERTIARY BUTYL HYDROQUINONE (T.B.H.Q.)
METHYL / PROPYL PARABEN
ETHYL / BUTYL ACETATE
I.P.A.
CARNAUBA WAX / CANDELILA WAX
VANILLIN
TITANIUM DIOXIDE ANATASE / PHARMA U.S.P.
HYDROXY PROPYL METHYL CELLULOSE (H.P.M.C.)
  USP - 2910
  METHOCEL E3, E5, E15, E50, K4M, E4M, K100, K15M
  PHARMACOAT 603, 606, 615
CELLULOSE ACETATE PHTHALATE USP (CAP)
LACTIC ACID 88-92% U.S.P.
HYDROXY ETHYL CELLULOSE "NATRASOL" LR/GR
SODIUM STARCH GLYCOLATE "PRIMOJEL"
MAGNESIUM ALUMINIUM SILICATE NF "VEE GUM /
  VEE GUM HV / VEE GUM F"
CARBOMER / CARBOPOL 934, 940
POLYSORBATE "TWEEN 20, 40, 60, 80"
HPMC -- COLOUR LAKE READY MIX FOR TABLET CO
  ING IN AQUEOUS/NON-AQUEOUS BASE "LUMI-NO-D

*CHEMICIRCLE PHARMACEUTICALS*

Shree Krishna Niwas, Room No. 51, Corner of B. Master Road, Kalbadevi, Bombay 400 002.
Phone: 318583, 313251; Resi: 481595; Tlx: 011-76777; Fax: 287 2134

---

For Your Requirements Of:

**(A) MICRO-FERTILISERS: (Partially/Fully Chelated)**

**POLYMAX (SOIL APPLICATION)**
**POLYMAX (IDEAL)**
**POLYMAX (SUPER)**
**POLYMAX (NPK - 15:15:15)**
**POLYMAX (LIQUID LEAF SPRAY)**
**POLYMAX (NPK - 9:9:9 - LIQUID)**
**ZINCMAX (ZINC-EDTA 12%)**
**FEROMAX (FERRIC-EDTA 12%)**
**MAGMAX (MAGNESIUM-EDTA 6%)**
**COP MAX (COPPER-EDTA 12%)**
**MANGMAX (MANGANESE-EDTA 12%)**
**BOROMAX ($B_2O_3$ 30% & Zn 13%)**
**MOLYMAX ($MoO_3$ 50% & Zn 8%)**

**(B) SODIUM BI-CARBONATE BASE**

**DRY CHEMICAL POWDER AS PER IS:4308**

**(C) PULVERISING JOB WORK ALSO UNDERTAKEN**

Please Contact:

**SATYAJIT CHEMICALS PVT. LTD.**

**Factory:** Stanny Compound, Khairani Road, Sakinaka, Bombay-400 072. **Tel.: C/o. 580886**
**Regd. Office:** 26, Harihar Niwas, Besant Street, Santacruz, Bombay 400 054.
Tel.: 6491621/6493821 Gram: "CHELASULPH" Bombay 400 054

# Science Briefs

## LOBAL WARMING THEORY EJECTED

Recent research studies on the ocean id the climatic changes have exposed e hollowness in the claims made by oponents of the global warming eory.

Environmentalists have blamed the ormous release of carbon dioxide ethane and chlorofluorocarbons FCs) into the lower atmosphere -which are called greenhouse gases -for the possible warming of the earth three to five degrees centigrade in the ntury.

But scientists say, "these greenhouse ses warm our planet making life posle. However, "if they were more undant, greenhouse gases might trap much heat". Says a US atmospheric ientist, Professor S. Fred Singer, "the ucial issue is to what extent other facrs remain the same".

After factoring more detailed cloud nulations into its computer models, British Meteorological Office cently showed that current globalrming projections could be cut into lf. At any given time, for example, uds cover 60 per cent of the planet, pping heat radiating from its surface t also reflecting sunlight back into ace.

So if the oceans heat up and produce re clouds through evaporation, the reased cover might act as a natural rmostat and keep the planet from ting up, meterologists feel. But pretions of catastrophic effect due to uild-up" of green-house gases were ently made, among others, by envimentalist and Director of Urban velopment Institute, Bombay, Dr. shmi Mayur.

According to Dr. Mayur, in another years, the $CO_2$ level in the atmosphere would touch 450 parts per million leading to a temperature rise of 3 to 5 degrees C. This would be enough to cause sea levels to rise by 5 to 50 feet, wiping out 20 per cent of India's coastline, he said at a seminar at Bombay.

Dr. Mayur has observed that the rise in sea levels wil not affect the Soviet Union much but erratic climate will be a source of great worry with sharp fall in agricultural produce in Asia. More findings have come to the fore, stoutly questioning the predictions of coastal flooding because of break-up of the polar ice-cap due to global warming.

Investigators at the US National Centre for Atmospheric Research attributed the North American drought in the summer of 1988 primarily to temperature changes in the tropical pacific involving a current called 'el nino' and not to the greenhouse effect. When ocean currents were included in recent computerised climate simulations, the Antarctic Ocean did not warm —diminishing the likelihood that part of its ice sheet would break up and add to coastal flooding.

As for the past decade, the increased warmth in three of its hottest years-1983, 1987 and 1988-is almost certainly associated with El Nino events in the pacific, it was revealed. Carbon dioxide is released by volcanoes, oceans and decaying plants but much of the buildup is said to be man-made.

$CO_2$ is given off when we burn wood or fossil fuels such as coal and oil. Methane, the next most abundant greenhouse gas, is released when organic matter decomposes in swamps, rice paddies and livestock.

Though there was largescale destruction of forests in nations such as Brazil, worldwide millions of hectares are planted with seeding trees each year. New studies have indicated that there has been no reliable data about the impact of forest destruction on global warming. In fact, recent research shows that the carbon content of forests had been vastly overestimated, suggesting that deforestation is not as great a source of $CO_2$ as was once thought.

It has been found out that the thinning or depletion of the ozone layer occurred only over the Antarctic, that too during September to November and then it repairs itself when atmospheric conditions change a few weeks later. The ozone layer shields the earth from the penetration of ultraviolet rays from the sun.

## BIOLOGICAL MONITORING TO PROTECT WATER RESOURCES

Biological monitoring is a means of assessing water quality, or the toxicity of chemicals, employing living organisms as the sensors. Relatively recent environment regulations have led to the application of biomonitoring techniques by wastewater discharge and chemical manufacturers. Classical approahes to biomonitoring have included the acute bioassay which takes death as the endpoint of the test. Recent developments include automated and real time biomonitors which utilise computer technology for assessing changes in physiological or behavioural parameters to indicate the presence of toxics.

Although having its roots deeply embedded within the academic community, the utilisation of biological monitoring techniques for the purpose of protecting waters has only recently become of major significance.

It was not until 1972 that biological monitoring even became a creditable consideration for assessing water pollution. However, for the next 14 years, the techniques, for regulatory purposes, were applied only when deemed "appropriate". Yet, the groundwork for such applications continued to be established. In 1975, the Environmental

Defence Fund and the National Resources Defense Council filed a suit against the U.S. Environmental Protection Agency (EPA). The resultant "consent decree" yielded a list of 126 so-called "priority pollutants". Most significant, the term "toxics" became fashionable.

**Lab and field techniques**

Recent advances in biomonitoring have seen the application of laboratory and field techniques for water pollution control studies. For example, consider the so-called "ambient toxicity test". In this, water samples are collected from the receiving system above, within, and below the discharge.

Yet another technique often used for regulatory purposes is to bring the laboratory to the site. Such mobile laboratory studies expose indicator, as well as representative species, in a real time fashion, to a continuous flow of the effluent and dilutions with the upstream water system. In theory, such an approach reduces the effects of effluent variability on the conclusions.

Artificial substrate techniques are commonly introduced into field biomonitoring assessments. In this manner, the laboratory concept of controls is incorporated into field assessments. Typically, rock baskets, glass microscope slides, and/or other materials of measured surface area are placed in the field to standardise the habitats among the sampling locations. However, the limitations of this approach include the fact that comparisons can be made only within the types of organisms capable of colonising such substrates.

Bioaccumulation is a general term used to describe a process by which chemicals are taken up by organisms either actively or passively through the water or through the consumption of food. The public first gained widespread awareness of the process in the 1960s with the discovery of compounds such as DDT and methyl mercury residues in fish and wildlife. It became recognised that the organisms highest in the food chain had the highest concentrations of such chemicals and the concept of "biomagnification" became popular.

In the case of DDT, the top carnivores were usually birds. However, in the case of methylmercury, the top carnivore, especially in countries like Japan, was man himself. Over the past two decades, exciting developments have been occuring with respect to automating biomonitoring techniques for the purpose of providing water quality personnel with early warning protection. Such developments have not approached those seen with advancements in physicochemical monitoring technologies. However, recent developments have been sparked by regulatory commitments to biological monitoring, public concerns over toxics, and moral concerns of the providers of our drinking water.

**Prospects for the future**

As things develop, the general public will be come more intimately aware of recent and future advances in biomonitoring. In some cases, this awareness will reflect increased pressures from the regulatory bodies requiring the regulated community to implement more and more biomonitoring techniques. Yet much of this awareness will arise from moral concerns.

The concepts underlying biological monitoring for protecting water quality are, at the least, very appealing. The employ living organisms as the sensors. They are capable of detecting the presence of a broad range of toxics. The mechanisms underlying some of the responses are suitable for automation. Some of the systems already automated and operating online are relatively inexpensive and require little training of non-skilled technicians for operation and maintenance.

The single most significant obstacle to the proliferation of automated systems is the lack of sufficient databases. The number of such applications are relatively small as compared to physicochemical monitors. Field validation of automated real time biomonitors must become far more extensive for these tools to become accepted. To become trusted, they must be capable of rapid response with the minimal of false alarms. Furthermore, they must be reasonable in cost while minimising complexity.

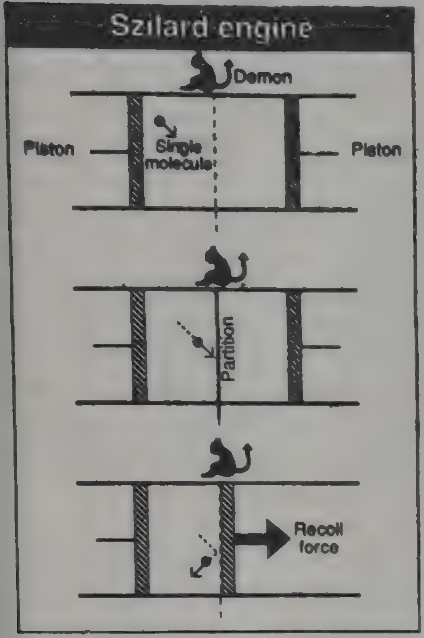
With the applications of real time biomonitoring or the applications of some of the more classical approaches to biomonitoring (bioassays, bioaccumulation, etc), two facts are certain. First an integrated approach of both chemical and biological monitoring must be incorporated into any water quality protection scheme.

Second, there must be a commitmen of financial resources by the regulatec community and the general public. Onl then can sufficient data be generated anc interpreted meaningfully, so as to ensur the protection of our water resources

## SECOND LAW OF THERMODYNAMICS VIOLATED?

It may be possible to violate th second law of thermodynamics, one c the foundation stones of physic according to a researcher in Californi Carlton Caves of the University c Southern California, Los Angele Believes that a theoretical device kno as Maxwell's demon can, in certain ci cumstances, do the impossible: transf energy from a cool body to a warm one.

The demon watches each gas mol cule that approaches and opens the do to let, a molecule through only if th molecule is fast moving — that is, ho In this way, the demon separates the h molecules from the cold ones, heatin one compartment and cooling the othe Caves uses information theory to sho how a demon can extract energy fro gas. It can do this, he says, by waitng for rare "thermal fluctuations" in he gas which put the molecules into nusually "simple" arrangements.



A Szilard engine consists of one molecule in a ox with a piston at each end (top). A demon extracts energy by dropping a partition into the ox (middle), then moving the piston in the empty half up to the partition (bottom). When he partition is moved, the molecule pushes the iston, giving it energy.

Caves uses a crude, and quite theoretical, type of demon, called a Szilard engine. This consists of a box with a piston at each and containing just one molecule. The demon extracts energy by first detecting which side of the box the molecule is on, then dropping a partition and moving the piston in the empty half of the box up to the partition.

## MAGNETIC RESONANCE IMAGING IN SOLIDS

The technique of nuclear magnetic resonace (NMR) imaging has been developed from the basic experiments on the physics of nuclear magnestism of nearly 50 years ago into a highly sophisticated tool used today for the characterisation and analysis of materials. The applications are now of immense importance in chemistry, biology and medicine as well as physics and other disciplines.

The techniques employ the principle that radio waves can be used to excite atomic nuclei that are in a strong magnetic fields so that they in turn emit radio waves at a frequency characteristic of the nuclear species (for example, hydrogen emits at about four times the frequency of carbon). The frequency is also sensitive to the local environment of the atoms, so a spectrum will be characteristic of the chemical composition and physical state (mobile liquid, rigid solid and so on) of the specimen under investigation.

High resolution NMR was first exploited with the sharp spectral lines normally found for mobile liquids. During the past decade or so, methods of investigating the high resolution spectrum in solids have become available using commercial spectrometers. Solid materials generally have broad NMR spectral lines but techniques now exist that artificially make the atoms behave as if they are in a liquid and thus produce narrow spectral lines.

They can be studied at high resolution and hence give the required analytical characteristics for the specimen studied. This can, for example, be accomplished by rotating the solid sample at high speed, thus simulating the atomic motion that naturally occurs in liquids and is responsible for the narrowed spectral lines.

Attention has been turned to solids or solid like materials. Often in non-medical applications and even in some medical areas it is desirable to look inside objects where molecules are either stationary or slow moving, and therefore produce broad nuclear magnetic resonance spectral lines. Successful imaging is much more difficult for these materials and either requires large magnetic field gradients or artificial line-narrowing methods.

Some form of artificial line narrowing is desirable and the combination of imaging methods with th line-narrowing methods similar to thos mentioned has been successful in producing two and three dimensiona images of small scale solid objects abou 10 mm in size.

There appears to be a wide range o potential applications ranging from materials used in defence and aerospace to the chemical, materials and pharmaceutical industries as well as medical appliations. In many cases the materials of interest that can be studied are hydrogen-rich solids such as plastic and polymers.

Biological materials that are composed of large molecules also often fall into the solid-like category. Although hydrogen is often the most favoured atomic nucles from the point of view of sensitivity and natural abundance, other nuclei can be used such as those of various elements in semiconductors, phosphorous in bone, carbon in composite materials and fluorine as used, for example, in some industrial plastics.

In medical applications water is normally observed. A significant proportion of the water molecules in biological tissue are, however, not mobile but are solid-like since they are bound to other parts of the tissue. These are not seen by the current medical imaging machines and yet they may well be an important probe of disease states.

The investigation of materials that are normally liquids but have become bound to solid-like surfaces is actually of wide application. Oils in rocks, for example, often present solid like characteristics, as do water and other liquids absorbed in porous materials such as food products. Their spatial distribution, extraction and changes with time are difficult to study by non-destructive, non-ionising methods other than MRI. Degradation, deterioration and damage often need to be monitored carefully.

Ceramic materials have important ses as high temperature structural naterials in, for example, turbine locks. Monitoring the performance and tructural integrity of ceramic componenents, cast materials made of epoxy esin or composite materials would provide a means of checking porosity, occurrence of cavities, impurities and foreign bodies that are likely to impair the performance of the material.

Polymers and rubbers can have their properties greatly enhanced by various treatments such as the additon of carbon particles or vulcanisation. It is virtually impossible to measure the uniformity of treatment of such materials non-desrtucively, but MRI imaging now offers exciting opportunities that have yet to be explored fully.

## SEA-BED MINING: CHINA TO JOIN SELECT CLUB

China is set to join the select club of 'pioneer investor' countries in sea-bed mineral exploration, and is making an official application for United Nations registration. In a significant step elevating it to the rank of major ocean mining countries, China has declared it has conducted surveys and prospecting activities for the mining of polymetallic nodules in the international sea-bed area of the northeastern Pacific Ocean.

As a result of these activities some areas have been delineated for registration as mine sites with the preparatory commission under the regime for pioneer investors, official Xinhua news agency quoted Chen Bingxin, chairman of the Chinese delegation to the commissioner's summer session in New York as saying.

China has submitted a letter to UN under-secretary general Satya N. Nandan who is also the secretary general's special representative for the law of the sea. Under a resolution adopted along with the law of the sea in 1982, countries which had already invested in exploration, research and development work relating to future sea-bed mining would be registered as 'poineer investors' by the commission and would receive mining contracts from the international sea-bed authority.

The 1982 resolution known as Resolution II, also identified as 'potential pioneer investors' four consortia whose components come from one or more of number of countries including, Belgium, Canada, West Germnay, Italy, Japan, the Netherlands, Britain and the United States.

To qualify as a 'pioneer investor', the applicant has to have spent at least 30 million dollars in sea-bed activities, as of January one, 1983. Currently India, France, Japan, and the Soviet Union which are also identified by Resolution II as potential pioneer investors' have been registered.

## SUGAR AS MEDICINE

The U.S. biotechnology companies and university scientists are presently trying to make use of sugar in producing drugs. Sugar will be used as medicine and not merely to make any medicine palatable. The companies had till now focused on developing protein drugs which could be made by genetic engineering. The president of Glycomed Inc., one of the companies developing sugar-based drugs, Alan R. Timms said, "this field is completely untouched".

## ECONOMIC TREATMENT OF HAZARDOUS WASTES

A new process which provides an economical and environmentallly sound way to deal with the increasingly serious problem of the disposal of hazardous industrial acid wastes is being made available in Israel and abroad as the result of technology developed by Prof. Avraham M. Baniel and Dr. Aharon Eyal at the Hebrew University of Jerusalem. The new technology retrieves and recycles the acid found in waste flow in industrial processes. It i marketed by Sepros Separation Processes Ltd., a joint venture involving investors and the Yissum Research Development Co. of the Hebrew University.

Existing methods for the treatment and disposal of acid-containing industrial effluents in an ecologically acceptable manner are often so costly that they endanger profitability. Indeed, manufacturing plants in some heavily industrialised countries have been forced to shut down as a result of this problem. This innovative method, however, involves a solvent extraction technology that removes acids from industrial waste solutions and recovers them for re-use.

The process is especially significan for the chemical and hydrometallurgical industries, in which large amounts of mineral acids are utilized. In addition to solving the acid disposal problem, the Sepros process also has the advantage say the researchers, of eliminating the need to use expensive chemicals to neutralize the acids. A further saving ensues in that acid saved from disposal becomes available once again for re-use in the same plant.

**-- News From Israe**

## NMDC FERRIC OXIDE PLANT INAUGURATED

The Rs. 165-lakh pilot plant for manufacture of ferric oxide built by th National Mineral Development Corporation (NMDC) was inaugurated a Hyderabad on August 25 by Mr. N Vittal, Secretary, Department of Electronics (DoE). Congratulating th engineers, Mr. Vittal stated the demonstration plant reflected the success o Indian technology which could pave th way for the country becoming a globa player in electronic materials. There wa an unutilised credit of $200 millio given by the World Bank to the electronics industry which could be used a working capital needs also.

# New Products

## W GLAND PACKINGS AND LS

'hampion, the trusted manufacturers sbestos Gland Packings and Seals introduced for the first time in a, the revolutionary non-asbestos itmaan" range of gland packings & s for toughest sealing jobs. These nisticated packings are safer, longer ing and less abrasive than conven- al asbestos based packings. These ings remain stable for extreme tem- tures and pH range from 0-14. They not affected by plain water and most osive chemicals and fluids.

'hese products are specially designed developed to solve the problems d by the Modern Industries by roving their plant efficiency and cing leaks & wastages. This results aving the loss of expensive product, e, energy and making the environ- t pollution free.

Qualities available in the following erent "Spitmaan" styles: le 1: Super fluorocarbon fibre pack- Style 2: Special tough PTFE pack- for high pressure applications; Style 'acking for all chemicals; Style 174: vance technology packing; Style 66: mium service high temperature king; Style 36: Universal super per- nance packing; Style 172: Super nbination packing; Style 166: A te and black multiservice chemical king; Style 374: Multi-service raulic packing; Style 2224: A pre- m stern tube packing.

'or further details contact: Surendra ding Company, 129, Narayan Dhuru et, Bombay 400 003. Tel.: 326615, 918.

## W COATING SYSTEMS

### rrosion resistant chemical coating aluminium/alloys

AC-24 is a chromatic conversion coating for aluminium and all its alloys. It forms a thin golden-yellow film and is applied for corrosion resistance. It replaces currently used anodic oxide film coatings and provides superior corrosion resistance. Characteristics of AC-24 and its user benefits include:

1. No necessity for high temperature and ventilation as required in all currently used anodic oxidation film coating.
2. No need for 24 hours waiting period or breathing apparatus for application.
3. Application process is simple immersion or spraying or brushing technique.
4. Can be used to provide a self-coloured corrosion resistance film on most types of non-critical aluminium pressing, extrusions, castings, spinnings etc.
5. Passes the US Govt. specification QQ-4-151 for salt spray test.
6. The film reforms after scratching on moisture contact.
7. AC-24 comes in concentrated liquid form.

### Decorative rust proof coating for aluminium

Chem-Cross have developed a new aluminium coating solution, AC-55, which besides its corrosion proof property, imparts a pale green colour to aluminium surface giving a decorative value. Coatings can be obtained at room temperature by simple brush, dip or spray application.

AC-55 coating solution is useful in outdoor aluminium furniture, hardwares, industrial components, fastners, window frames etc.

### Coating for galvanised products and zinc sheets

ZN-44 a chemical solution developed by Chem-Cross is used for coating purpose on zinc sheets, parts and alloys. It imparts a clear colourless protective surface or film having improved corrosion resistance. It prevents discolouring of zinc sheets and galvanised items and protects them from white bloom formation which normally occurs during storage, in the high moisture conditions or salt atmosphere.

The coating treatment is by simple dipping, brushing or spraying, requires very short time and can be done without heating the solution. ZN-44 is also suitable for strip-line operations such as mill galvanised sheets and wires.

### Bright-dip coating solution for aluminium

Chem-cross have developed a bright-dip coating solution AC-64 for aluminium and alloys to improve its appearance and attain corrosion resistance simultaneously. Application is at room temperature by dipping, spraying or brushing and is very fast. It produces a clear colourless coating in few seconds which provides protection to aluminium and prevents dulling of the surface.

AC-64 finds application where surface is to be protected in long storage, long shipment times or sea weather in order to retain the bright finish of aluminium.

### Phosphating compositions

Chem-cross have developed several new, more efficient phosphate coating composition for use with ferrous metal articles.

Improved phosphate coatings contain accelerator and can be applied for some applications even at ambient temperatures without the necessity for heating the baths. The coatings impart corrosion resistance and forms a surface which will form a strong bond if a surface is to be painted. Phosphate coating layer also acts as lubricants or as aids in metal working and metal drawing operations. Phosphating solutions can be supplied which meet various salt spray tests and international standards.

For more details on the above mentioned products write to: Chem-Cross, 4, Loop Lane, Race Course Road, Bangalore 560 009. Phone: 261737, 266415.

## SILICONE SEALANTS FOR GLASS PROCESSORS

Silicone mirror adhesive, silicone aquarium adhesive, glass-clear silicone sealant and multiple glazing silicone 5440, which were recently introduced onto the European market by Bayer subsidiary BAVG (Bayer Anhydrit Verkaufsgesellschaft mbH) and have been well received there, are now supplementing that company's range of ®Formflex materials for glass processors.

The elastic and dimensionally stable one-part mirror adhesive has already gained a good reputation in America. With its high elongation at break values it enables mirror glass to be stuck to a large number of materials in such a way that stresses, which could represent a hazard for the glass, are absorbed.

Formflex mirror adhesive, which reacts with moisture of the air and has the added advantage that it cannot make the reflecting surfaces blind, is applied as a rope from 310ml cartridges. At 20°C and approximately 60% relative humidity it acquires its final strength after about 24 hours.

Formflex glass-clear silicone is an elastic one-part sealant which, because it possesses great adhesiveness, high strength and elasticity over a wide temperature interval, is suitable for sealing showcases and display windows. It can also be used to bond and fix optical glasses.

Formflex Silicone 5440, a one-part silicone which has been developed for industrial users, is a solvent-free adhesive and sealant for multiple glazing. Excellent adhesion to glass, aluminium and galvanised steel enable it to be used for sheet circumference gasketing (secondary sealing) of multiple glazing units.

The reaction which transforms the sealant into an elastic material with good resistance to ageing and ultraviolet light is caused by atmospheric humidity. Formflex silicone 5440 is compatible with the usual butyl compositions and supplements BAVG's numerous well-proven joint sealants, some of which are likewise used in the fabrication of glass facades.

BAVG's established products also include the Formflex aquarium sealants and adhesives. These elastic one-part silicones were specially developed for all-glass aquaria. They meet the requirements of E DIN 32622/-01.85. Here too, the manufacturer's many years of experience in the production of sealants for damp rooms has been exploited for the benefit of glass processors.

For details contact: Jagat Chemicals Pvt. Ltd., Express Towers, Nariman Point, Bombay 400 021.

## ROTARY PUMP

Flex-I-Liner plastic pump designed for low maintenance, meters sodium hypochlorite. This self-priming, seal-less rotary pump is driven by a d.c. motor regulated with a controller. It is said to be suitable for flows upto 76 litres/min and pressures upto 50 psi at temperatures upto 85°C. Only its flexible liner and solid plastic body block come in contact with fluid being pumped. Agents are wanted.

For further details write to: Vanton Pump & Equipment Corp., Dept. CN, Hillside, New Jersey, 07205, USA.

## FILTERING SYSTEM

The modular "Vitalizer II" can be customised for residential and small commercial applications. Installed under the sink, it features filters, a carbon filter, and a reverse osmosis module that removes sediment, chemicals, heavy metals, and other contaminants. It produces from 38 to 760 litres/day, depe ing on options, which include a stor tank, ultraviolet light, and a deionisa module. Agents are sought.

For further details write to: Try Research Inc., Dept. CN, 1122, S. S St., 22, Provo, Utah 84601, USA.

## SINTERING POWDER COATI

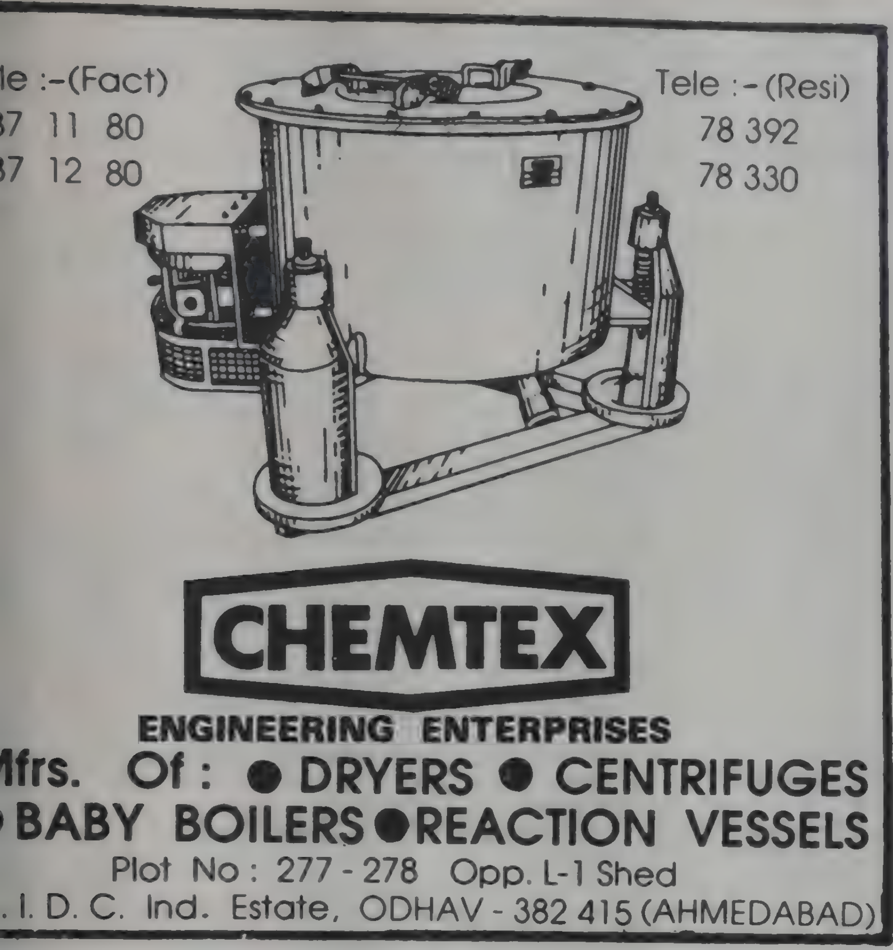
Cableways installed in a new tun on the Antwerp underground in 1989 were coated with Levasint S sintering powder from Bayer AG, us the fluidised bed process. This met of coating cable bundles not only of economic benefits, but also impro safety aspects. Because coating Levasint had proved such an outsta ing success on over 290 kilometre cableways in the Brussels undergrou it was also prescribed for the 1.5 k metre tunnel under the River Sche

The 400 mm thick, non-porous c ing is sintered in a single operation affords reliable long-term corrosion tection owing to its good cover chemical resistance. The coating is e trically non-conductive and was rate non-flammable in fire tests condu by the University of Ghent in ac dance with the French standard 57/1161.

According to the coaters, Levasi easy to process and caused no envi mental problems. The low melting perature means that the substrate t coated need not be heated to such a degree, thus saving both money energy.

The sintered coating remains fle within a broad temperature range. repairs which may be necessary can be carried out without difficulty u this thermoplastic material.

For further details write to: Chemicals Pvt. Ltd., 17th F Express Towers, Nariman P Bombay 400 021.



le :-(Fact)
7 11 80
7 12 80

Tele :-(Resi)
78 392
78 330

**CHEMTEX**

**ENGINEERING ENTERPRISES**

**Ifrs. Of : ● DRYERS ● CENTRIFUGES**
**BABY BOILERS ● REACTION VESSELS**

Plot No : 277 - 278 Opp. L-1 Shed
. I. D. C. Ind. Estate, ODHAV - 382 415 (AHMEDABAD)

**FOR YOUR REQUIREMENTS OF:**

**AGNESIUM SULPHATE Crystals/Tech/I.P./L.R. Grade**
**AGNESIUM SULPHATE Dried/Anhydrous all Grades**
**AGNESIUM CHLORIDE PHARMA GRADE**
**LUM (Non-Ferric) Anhydrous**
**INC SULPHATE PHARMA GRADE**
**INC CHLORIDE**
**ALCIUM CHLORIDE Fused/Anhydrous**
**ODIUM SULPHIDE**
**ODIUM BISULPHITE**
**ODIUM SULPHITE**
**ODIUM META BISULPHITE**
**YPO**

Please Contact Manufacturers:

MERCERS CHEMICAL INDUSTRIES (INDIA)
MAG-PHARM INDUSTRIES

231, Samuel Street, Vadgadi, Bombay 400 003.
*Regd. Off.: 32, Pais Street, Byculla (W), Bombay 400 011.*
elephones: 377760/343117 Grams: 'LAXNAGAR'

**Available Regularly at Most Competitive Prices**

Acetone
Acetic Acid Glacial
Aluminium Sulphate
Butyl Acetate
Butyl Acrylate Monomer
Carbon Tetrachloride
Caustic Soda Solid/Flakes
Copper Sulphate
Citric Acid
Di Ammonium Phosphate
Di Ethylene Glycol
Formaldehyde
Formic Acid
Gohsenol GH-17
Gold Bronze Powder
Hydrogen Peroxide
Hydrosulphite of Soda
MCA (Monochloro Acetic Acid)
N Butyl Alcohol
Oxalic Acid 98/99%
P.V.A. 173, P.V.A. 208
Polyethylene Glycol
Potassium Carbonate
Potassium Bichromate
Rangolite C
Sorbitol Liq.
Sodium Bicarbonate
Sodium Alginate
Sodium Bichromate
Sodium Nitrite
Sodium Perborate
Sodium Sulphide Flakes/Solid
Sodium Meta Silicate
Titanium Potassium Oxalate
Titanium Dioxide
Trisodium Phosphate
Triethanolamine
Urea Technical Grade
And other chemicals

Please Contact

TRIBHOVANDAS
KHIMJI & BROS

Mangaldas Building No. 5,
36, Trikamji Ghia Marg,
(Kitchen Garden Lane)
Bombay 400 002
**Phones: Off.: 310132/311385**
**Resi: 355044**
**Grams: "SARKEV", Bombay-2**
*MORE THAN 70 YEARS OF SERVICE TO VARIOUS INDUSTRIES*

Available Regularly Original and Distilled SOLVENTS
at most competitive price

**I.P.A./N. BUTANOL**
**ACETONE/DI ACETONE**
**BUTYL ACETATE**
**ETHYL ACETATE**
**OCTANOL/M.C.B.**
**ANILINE OIL**

**M.D.C./E.D.C.**
**T.C.E.**
**M.E.G./D.E.G.**
**XYLENE**
**TOLUENE/BENZENE**
**PHENOL**

Please Contact:

GOODEARTH PETROCHEMICAL INDUSTRIES
TARUN PETROCHEMICAL

*Sales Office:* 19, Bhandari Street, 10, Karimji Building, Bombay 400 003.
*Regd. Office:* 156/4, Chandrakiran, Sher-E-Punjab Colony, Mahakali Caves Road, Andheri (E), Bombay 400 093.
Phone: 345466, 322829; Resi: 6346603, 6321061

**WE ALSO PURCHASE WASTE SOLVENTS & PHENOL CRUDE MIXTUR**

FOR YOUR REQUIREMENT OF

**META CRESOL 40-42%**
**PURE META CRESOL 98%**
**PURE PARA CRESOL 98%**
**SODIUM SULPHITE 78-80% & 85%**

**ORTHO CRESOL 98%**
**ORTHO CRESOL 90%**
**RESORCINOL**
**METANILIC ACID**

**META TOLUIDINE**

**Manufactured by:** ATUL PRODUCTS LTD.

PLEASE CONTACT DISTRIBUTORS/AUTHORISED AGENTS

CRESCENT CHEMICALS

**Regd. Office:** 404, Faiz-E-Qutbi, 375, Narsi Natha Street, Bombay 400 009.
**Tel.: 342231/348096/348305 * Telex: 011-5412 CRES IN**

**Sales Office:** 56-B, Sanjay Building, 5 Mittal Estate,
Andheri Kurla Road, Bombay 400 059.
**Tel.: 6322697/6342320/6329110/6322136**

- **Spindle Oils, Metal Working Oils, drawing compounds and speciality mineral White Oils.**
- **Naphthenate & Octate Driers, Offset Ink Media, Letter Press Varnishes, Synthetic Drying Oils for Paint and Printing Ink Industries.**
- **Copper and Zinc Naphthenates as Fungicides and Wood Preservatives.**
- **Synthetic Pine Tar and Process Oils, Mould release & Separating Agents and Micraffins for Rubber Industries.**
- **Petroleum Jellies: White, Pale Yellow and Amber and Speciality Waxes.**
- **Wax Emulsions and auxiliaries for Leather, Paper, Textiles and Wood Industries.**
- **Hard and Synthetic waxes for use in Polishes, Castings, Carbon Paper, Adhesives, Coatings etc.**
- **Petrochemical Specialities: Mahathol Calibration Oil for Diesel Injection Test Benches; Additives for fuels and lubricants.**

Manufacturers:

MAHATHA PETROCHEMICALS **(Estd. 1969)**

*(Manufacturers of Speciality Oils, Waxes, Additives etc.)*
Sree Meenakshi Gardens, Kizhakattalai, Old Pallavaram P.O. Madras 400 043.
**Grams: PETROCHEM Phone: 431542**

# Industrial and export opportunities of other petrochemicals

P.S. BALASUBRAMANIAN

(Continued from the previous issue)

## LASTICIZER ALCOHOLS

**Introduction:** Plasticizer alcohols are lower range alipha- c alcohols with carbon chain length ranging from six to even. However Butanol ($C_4$) also finds extensive applica- on as plasticizer alcohol and is included alongwith the other anges. These plasticizer range alcohols are available in varied orms from the commercially pure materials (2-Ethyl Hex- nol) through complex isomeric mixture (iso octyl alcohol – a mixture of branched hexanols and heptanols). The plas- cizer alcohols derive its name from the fact that its major pplication is in the manufacture of plasticizers — partic- larly for poly vinyl chloride (PVC). They also have wide ange of uses in other industrial and consumer products like ıbricant additives, herbicides, cosmetic, solvent etc. As with etergent alcohols, the plasticizer range alcohols are little used s is, but rather as the ester derivatives of various acids such s phthalic acid, adipic acid etc. (e.g. di octyl phthalate). The arious end uses of plasticizer alcohols are given in Table . The process employed for their manufacture are similar o that of detergent range alcohols and include the Ziegler Chain growth process starting with ethylene as feedstock and e oxo process or hydroformylation where first the olefin, ydrogen and carbon monoxide react to form aldehyde, which s then hydrogenated to alcohol. The total investment required vould be approximately Rs. 180-200 crores. Most of the n- utanol in our country is currently being manufactured using thyl alcohol as feedstock and it is likely that it will continue o be the main feedstock in the future.

**Industry Review:** In India, the most widely used plas- icizer alcohols are 2-Ethyl Hexanol, Octanol, iso-octanol and -butanol. However, nonanols ($C_9$) and decanols ($C_{10}$) are lso used, although, to a limited extent. 2 Ethyl Hexanol is sed in the manufacture of 2-ethyl hexyl acrylate, an inter- nediate used in adhesive and surface coating applications, n herbicides and surfactants, as a dispersing and wetting gent, as a penetrant in the mercurising of cotton, as a sol- ent for gums and resins and as a cosolvent for nitrocellu- ose plants and lacquer. 2-Ethyl Hexanol is manufactured by lcohol condensation of butyraldehyde, which is derived from ropylene via the oxo process. It can also be derived from cetaldehyde via ethylene. At present 2-Ethyl Hexanol in ndia, is being manufactured by only two units viz NOCIL nd Union Carbide (Oswal Agro), with a total capacity of 11,600 TPA. Our present consumption of 2-Ethyl Hexanol is around 18,000 TPA with 6,500 TPA being imported. As per the report of the Committee for Perspective Planning for Petrochemical Industries, the demand for this product is expected to be around 35,700 tonnes by 1994-95 and 52,500 tonnes by 1999-2000. As regards other oxo alcohols like iso octanols and decanols, there is only one producer, Indo Nissan Oxo Chemicals with an installed capacity of 10,000 TPA. Currently the demand is put at around 9,000 TPA which is expected to reach a level of 11,900 tonnes by 1994-95 and 17,500 tonnes by the turn of the century. N-butanol which is mostly manufactured using ethyl alcohol as feedstock has an installed capacity of more than 15,000 TPA with approximately 8,000 TPA being utilised for plasticizer manufacturing. The requirement of N-butanol used for platicizer manufacturing is expected to grow to 9,400 tonnes by 1994-95 and to the level of 13,600 tonnes by 1999-2000. Recently Andhra Petrochemicals and Indo Nissan Oxo Chemical have each received an LOI for 30,000 TPA of 2-Ethyl Hexanol/C Butanol/C Octanol/C Decanols. If both these are implemented, there would not be any further requirement of additional capacity even by the year 1999-2000.

**Current Capacity (TPA)**

| | |
|---|---|
| NOCIL (2-Ethyl Hexanol) | 10,000 |
| UCIL (Oswal Agro) 2 EH | 1,600 |
| Indo Nissan Oxo Chemicals (Iso Octanol etc.) | 10,000 |
| N-Butanol | 8,000 |
| | 29,600 |

**Forecast Demand (Tonnes)**

| | 1994-95 | 1999-2000 |
|---|---|---|
| 2-Ethyl Hexanol | 35,700 | 52,500 |
| Iso Octanol/Decanol | 11,900 | 17,500 |
| N-Butanol | 9,400 | 13,600 |
| | 57,000 | 83,600 |

**Forecast Capacity (Tonnes)**

| | |
|---|---|
| Existing | 29,600 |
| New Capacities | 60,000 |
| | 89,600 |

## ALPHA OLEFINS

**Introduction:** Alpha Olefins are straight chain olefins with a single-double bond at the chain end position. Typically, commercial products fall in the range all the way from butene-1 ($C_4$) to octadecene-1 ($C_{18}$). The highly reactive group at the predetermined terminal position has been responsible for opening up vast areas of application. The various alpha olefins end up in a broad spectrum of chemical products, many of which are fast growing in their own right. Among the brightest areas currently are the use of the lighter ($C_4$-$C_8$) linear alpha olefins as comonomers in linear low density polyethylene (LLDPE) and high density polyethylene (HDPE) and as feedstocks to make polyalpha olefins used in synthetic lubricant base stock. Other major uses of alpha olefins include manufacture of detergents ($C_{12}$-$C_{18}$) and other industrial chemicals and plasticizers ($C_4$-$C_{12}$ & $C_{20}$+).

**Industry Review:** The development in the use of alpha olefins in India is in a nascent stage. At present, Butene-1 is the only alpha olefin produced in the country and that is from FCC cracker units in refineries. Otherwise there is no facility for large scale production of alpha olefins from naphtha/gas crackers. Internationally, alpha olefin is being produced either by ethylene polymerisation or from natural fats and oils. The ethylene polymerisation process would require establishment of a naphtha/gas cracker and investment would have to be quite high. Comparatively, alpha olefin manufacture from natural fats/oils requires lesser investment. This involves high pressure hydrogenation of fatty acids to produce fatty alcohols which are then converted into alpha olefin by dehydration at an elevated temperature.

**Alpha Olefins in industrial chemicals and surfactants:** As indicated earlier only Butene-1 is produced in India from the refineries which are extracted and used as feedstock for certain industrial chemicals like Maleic Anhydride, MEK, etc. It is also used in polybutadiene manufacture as a processing media.

Use of heavier alpha olefins in the detergent/soap industry is being pursued by our industry with M/s. Godrej leading the way. The alpha olefin sulphonates which are considered to be third generation detergent actives have already found in roads into the Indian market. It is claimed that the alpha olefin sulphonates ($C_{12}$-$C_{18}$) would not only substitute scarce coconut oil and other vegetable oils in the toilet soap, but also are useful in reducing wastage of soap in hard water areas and doing away with STPP thus eliminating pollution arising from eutropication of lakes and rivers. Although AOS would be more expensive than LABS, AOS has superior properties and could be used synergestically with other active ingredients in soap/detergent manufacture. However, the growth of AOS in the International market has been rather slow compared to LABS. This m be attributed to the availbility of soft water in other cou tries. Considering the present status of AO, it is possible replace 3-4% LAB demand by AOS by 1995 and 5-6% LAB demand by 2000 AD. Also recent studies have show that AOS could replace fatty material in laundry soap to th extent of 15% which later could grow to 40%. Based on the assumptions, consumption of alpha olefins for surfactan alone is expected to be around 17,000 MT in 1994-95 an 32,000 MT by 2000 AD. Due to its broad based consumin nature, the surfactants sector is dictated by consumptio trends. Production of surfactants has therefore to be in lin with consumption trends and changing consumer pattern eve if it means lower capacity utilisation in detergent formulation units. As far as exports are concerned, possibilities exi for $C_{16}$-$C_{18}$ ranges, since these are in short supply internationally.

There has also been a major effort to gain acceptance fo use of Alpha Olefin Sulphonates (AOS) in detergents worldwide. However, commercial usage so far has been very mino and Japan remains the only country where AOS is a majo surfactant. India also has shown interest in this product an is expected to replace LABS to the extent of 4-5% in th future. It seems probable that AOS will continue to grow i speciality applications, but does not appear to be a contende for large volume applications. As shown in Table 3, AO constituted only 1% of the total world anionic surfacta market in 1987. Wherever major capacity increase of AO a being thought of, these are primarily to support strong deman for light olefins as comonomers in polyethylene. Also, si able quantities of AO are used for alcohol production sinc detergent alcohols have better detergent characteristics. Th major hurdle for the usage of AOS in detergents has bee the high cost of capital for sulphation and multiple step involved in its production. Unless a competitive manufa turing process is developed for AOS, it is not expected replace LABS in the near future.

**Alpha Olefins in Polymers/Plasticizers:** Derivatives alpha olefins find applications in the field of polymers fo reducing crystallinity and hence enhancing resin characte istics such as flexibility and environmental stress crackin This application is by internal action. Phthalate esters (cu rently, DOP, DIDP, DNP, DBP) of $C_7$-$C_{11}$ alcohols a being used as plasticizers. $C_4$-$C_8$ alpha olefins are used comonomers during polymerisation e.g. in LLDPE an HDPE. The current demand would be approximately 10,0 TPA of $C_4$ olefins. The demand for $C_6$-$C_8$ alpha olefins present is almost negligible in India. However, in US an elsewhere, $C_6$ alpha olefins are predominantly used comonomers for LLDPE and therefore is a fairly promisin product for export. Since the competition for polymers mainly form natural materials like paper, jute, glass, metal ment, etc, sufficient market for material produced can be eated by adopting intensive market/application develop-ental efforts. Hence the working of demand would be based expected production level.

**pha Olefins in Lubricants:** Yet another application of pha olefins which is still untapped in India is in the man-acture of lubricants. $C_8$-$C_{10}$ alpha olefins are trimerised to ly alpha olefins (PAO) with viscosity range of 2-8 cen-trokes. These find extensive application as lubricants in tomotive, industrial and aerospace fields. Their superior alitities could be attributed to their low temperature fluid-, high temperature thermal stability, lesser flammability, gh viscosity index and low volatilitly in relation to viscos-. Before the lubricant market can undergo a structural ange by way of characteristics, the PAO lubricant formu-ion would not have a standing on its own. Thus the initial forts would be at replacing existing lubricant formulation economic grounds. It is estimated that by 1990-91 the mand for PAO could be put at 10,000 MT in the viscosity nge of 4-10 centistrokes. PAO based lubricant formulations claimed to contribute a 4-5% energy saving. Export of ese products also could be considered.

**esent Industry Status:**

*) Capacity:*

| | |
|---|---|
| Current licensed capacity: NIL | |
| Letter of Intent (LOI) for Godrej rice bran oil based AO ($C_{14}$-$C_{18}$): | 30,000 TPA |

*Consumption Trends:*

| Year | Imports | Consumption |
|---|---|---|
| 1979-80 | 200 | 200 |
| 1984-85 | 1,100 | 1,100 |
| 1989-90 | 3,000 | 3,000 |

*Projected Demand Supply Gap* ($C_4$-$C_{30}$)*

| | | |
|---|---|---|
| 1994-95 | : | 64,800 |
| 1999-2000 | : | 1,20,000 |

ssuming 80% capacity utilisation of the Godrej plant.

The major end users and the demand forecast sector-wise ve been given in Table 1 and Table 2 respectively. Table ives the worldwide anionic surfactant demand in 1987.

Table 1

ALPHA OLEFINS MAJOR ENDUSES

| rbon mber | Derivatives | Enduse |
|---|---|---|
| | LLDPE | Plastics |
| | Maleic anhydride | |
| | MEK | |
| | Butene-1 (as such) | PBR Processing |
| | Butyl Rubber | Speciality Tubes |
| $C_6$ | LLDPE | Plastics |
| | $C_7$ Oxo Alcohols | Plasticizers (PVC) |
| $C_8$ | LLDPE | Plastics |
| | $C_9$ Oxo alcohols | Plasticizers (PVC) |
| | $C_{16}$ Olefins | Sulphonates for detergents |
| $C_8$ | Mercaptans | Chain transfer agent for controlling polymerization |
| | $C_8$&$C_{10}$ Mixed trimer | Lubricating oils |
| | $C_{10}$ as such | LAB |
| | Lauryl Alcohol | Alcohol sulphates<br>Alcohol Ethersulphates for surfactants |
| | Decyl Phenol | AO condensates for non-ionic surfactants |
| | $C_{11}$ alcohol | Plasticizer (PVC) |
| $C_{11}$-$C_{14}$ Alpha as well as mixture of internal olefins) | LAB | Detergents |
| | Dialkyl benzene | Lubricating oils |
| | Fatty alcohols | Alcohol sulphates, EO condensates for non-ionic surfactants |
| $C_{12}$ | Lauryl Alcohol | Alcohol sulphates/ether sulphates for surfactants |
| $C_{12}$ | LAB | Detergents |
| | AOS | Toiletries |
| $C_{12}$ | LAB | Detergents |
| | AOS | Household & Indl. detergents, toilet soaps and shampoos |
| $C_8$ | Alkane Sulphonate | Detergents |
| | Chlorinated Paraffins | Secondary Plasticizer (PVC) |
| $C_{14}$-$C_{18}$ | AOS | Household and industrial detergents, toilet bars |
| $C_{20}$-$C_{24}$ | Chlorinated Paraffins | Secondary Plasticizer |
| | Synthetic fat liquor | Leather tanning |
| $_{24}$+ | Waxes/Speciality | Candles, |
| | Waxes/Emulsion | Crayons, paper/cardboard coatings, textile processing |

Table - 2

FORECAST DEMAND FOR ALPHA OLEFINS

(In Metric Tonnes)

| Sector | 1994-95 | 1999-2000 |
|---|---|---|
| Surfactants ($C_{12}$-$C_{18}$) | 17,000 | 32,000 |
| Polymers, LLDPE/HDPE plasticizers | 10,000 | 25,000 |
| Comonomers in LLDPE/HDPE ($C_4$-$C_8$) | 15,000 | 25,000 |
| Plasticizer Alcohol ($C_7$-$C_{11}$) (including demand for PVC cloth/carpets) | 20,000 | 25,000 |
| Industrial Chemicals ($C_4$-$C_{10}$) (Eg. Maleic anhydride, MEK, etc.) and Lubricants (Poly Alpha Olefins) | 16,000 | 25,000 |
| Others (Chlorinated Paraffin/ Waxes/Emulsion, etc.) ($C_{20}$+) | 10,000 | 12,000 |
| Total | 88,000 | 1,44,000 |

Table - 3

WORLDWIDE ANIONIC SURFACTANTS DEMAND

(Thousand Metric tonnes, 1987)

| | Volume | % of total anionics |
|---|---|---|
| Linear Alkyl Benzene Sulphonates (LAS) | 1950 | 58 |
| Branched Alkyl Benzene sulphonates (ABS) | 620 | 19 |
| Alcohol Ether sulphates (AES) | 490 | 15 |
| Alcohol Sulphates (AS) | 180 | 5 |
| Paraffin Sulphonates (SAS) | 70 | 2 |
| Alpha Olefin Sulfonates (AOS) | 40 | 1 |
| Grand Total | 3350 | 100 |

## ACRYLONITRILE (ACN)

**Introduction:** Acrylonitrile is one of the basic raw materials to the synthetic fibre industry i.e. acrylic fibres and to the plastics industry where products like ABS and SAN are made. Further it is used in the manufacture of acrylamide/polyacrylamide (although not produced in India at present) which is used in the water treatment/textile industry and in various other products of organic synthesis. The demand for ACN has been on constant rise with the synthetic fibre and the engineering plastics market showing healthy consumption trends. The other products like acrylamide and polyacrylamide which are presently being imported also hold a good market potential in the future.

Acrylonitrile is manufactured by the reaction of propylene, ammonia and air. Sohio (acquired by BP Chemicals) today is the acknowledged world leader in licensing the ammo idation technology. Availability of propylene which is scar has been one of the major hurdles in setting up of manufa turing facilities for ACN.

One another crucial aspect to be looked into before se ting up manufacturing facilities for ACN is the environment pollution problem. Production of ACN is unavoidably asso iated with the production of highly toxic Hydrogen Cyani (HCN), the disposal of which is a problem. HCN cannot sold to any far off location due to its handling problems a thus would have to be consumed locally for either manufa ture of Methyl Methacrylate or Sodium Cyanide which wou attract additional investment. This alongwith the scarce pr pylene availability has been very discouraging for any pr spective entrepreneur to enter the field.

**Current Licensed Capacity:**

| | |
|---|---|
| IPCL | 30,000 TPA |

**Industry Review:** In India, presently only M/s. IPC Baroda is manufacturing ACN with a capacity of 30,0 TPA. M/s. IPCL captively consume more than half of th acrylonitrile production for acrylic fibre manufacture a hence less than 50% is available for outside market. Our c rent consumption of ACN has been approximately 56,0 TPA with 26,000 tonnes being imported per se or as end p ducts. The major growth of ACN has been in the acrylic fi manufacture which has already captured more than 10% the total synthetic fibre market. Another promising use in textile field is in cyanoethylation of cotton to improve properties of mildew, heat, acid & abrasive resistance to make it more receptive to dyes. A second field that sho considerable promise for expansion and growth is ACN ba plastics such as ABS, SAN etc. These plastics have all ro properties, which are tough, mouldable and resistant to h light and solvents. Other than fabrics and plastics, use of A in acrylamide and acrylates also are expected to hold a p mising future. In the Indian market more than 80% of A is consumed by acrylic fibre, while acrylates consume aro 12-14%. The remaining is consumed by ABS resins.

**Forecast Demand* (Thousand Tonnes):**

| Enduse | 1994-95 | 1999-2000 |
|---|---|---|
| Acrylic Fibre | 113.0 | 150.0 |
| ABS Resins | 6.0 | 8.8 |
| Acrylates | 6.6 | 8.6 |
| Others (Acrylamide, etc) | 3.0 | 7.0 |
| Total | 128.6 | 176.4 |

* The figures are as given by the Report of the Committee for Perspe Planning for Petrochemical Industry

**recast Capacity (TPA):**

| | |
|---|---|
| Existing | 30,000 |
| Reliance | 70,000 |
| | 1,00,000 |

us there exists a scope for another unit to come up.

**International Scenario:** The present world production of ylonitrile is approximately 3.5 million tonnes/year. Cur- t world market demand is estimated at 3.05 million ton- s/year and it is expected to rise to 4.1 million tonnes by 92. China has been one of the main importers of acrylic re from Europe but of late they have stopped importing. CN producers in Europe are believed to prefer selling pro- lene rather than continuing to produce ACN, as stocks are ilding up. This has been exacerbated by reduced demand om the fashion industry, as current trends favour polyes- /cotton rather than acrylic knitware. Far East has been a ajor importer of ACN from US taking some 2.5 lakh tonnes 1987-88. It is reported that in China an additional capac- of 50,000 TPA of ACN is being contemplated and in iwan another 1 lakh ton/year which is also held up on envi- nmental grounds. Also it is understood that the problem propylene availability would keep South Korea a major CN importer. Thus a potential for exporting ACN from dia exists, provided the price is competitive.

## ALEIC ANHYDRIDE

**Introduction:** Maleic Anhydride is an important chem- al manufactured by partial oxidation of either benzene or itane. It can also be recovered as byproduct of phthalic hydride. It is used mostly in the manufacture of agrochem- als (pesticides), alkyd resins, plasticizers, pharmaceuticals, termediates, paper sizing, reinforced plastics, etc. Malath- n, maleic hydroxide are the two important pesticides using aleic anhydride. Their share in the total consumption is more an 30%.

**Current Capacity (TPA):**

| | |
|---|---|
| Adarsh Chemicals & Fertilizers | 3,000 |
| Allied Aromatics | 3,000 |
| Thirumalai Chemicals | 750 |
| | 6,750 |

**Industry Review:** As shown above, at present there are ree manufacturers of maleic anhydride with a capacity of 750 TPA. Adarsh Chemicals & Fertilizers Ltd. was the first nit to begin production of maleic anhydride and until cently was the only producer. M/s. Allied Aromatics production was highly erratic due to technical problems but recently the plant has been revamped which has helped in stabilised production. Our present capacities are based on benzene as feedstock while a new technology based on n-butane is being used in the rest of the world. This technology is preferred because it is environmentally more safe and also more efficient. Thirumalai Chemicals produces maleic anhydride as a byproduct and began production in 1986. Currently the total production is estimated to be approximately 6,000 TPA with imports of around 600 tonnes made under OGL last year, putting the total consumption at approximately 6,600 TPA. The demand for pesticides like malathion, maleic hydroxide are expected to increase rapidly.

Consequently the demand of maleic anhydride for agrochemicals is also expected to grow at more than 20% per annum. Similarly the use of maleic anhydride is expected to expand rapidly in alkyd resins and plasticizers. The use of maleic anhydride in these industries has remained limited mostly due to non-availability of indigenous production. The growth in demand from alkyd resins in expected to be at 14%. It is being used in polyester resins also. Some 15% of the total production is being consumed by polyester resin manufacturers. The demand is expected to grow at 10% per annum. Some 15% is being used for other uses mainly in pharmaceuticals and dyes industry. This consumption is also expected to increase at 12%.

Thus according to the growth trends, it is expected that by 1994-95 the total demand would be approximately 14,000 TPA. However as projected by the Committee for Perspective Planning of Petrochemical Industries the demand would be 10,500 TPA by 1994,95 and 15,000 TPA by the turn of the century.

**Forecast Capacity (TPA):**

| | |
|---|---|
| Existing | 6,750 |
| Expansion | 6,000 |
| Thirumalai Chemicals | 10,000 |
| Mysore Petrochemicals | 1,000 |
| Ganesh Anhydride | 7,000 |
| | 37,750 |

This much capacity would easily take care of the demand by 1994-95. Also some more letters of intent have been issued which if implemented could very well take care of the demand by the year 1999-2000.

## PROPYLENE OXIDE / PROPYLENE GLYCOL

**Introduction:** Worldover propylene oxide has been produced since 1920's by the chlorohydrin process starting with propylene and chlorine. The propylene chlorohydrin formed is dehydrochlorinated with calcium hydroxide producing propylene oxide alongwith calcium chloride as a waste product. Presently there are no manufacturers of propylene oxide and propylene glycol in our country. PO by itself is not used but its derivatives like propylene glycol and polyols find extensive application. More than 60% of PO is converted to polyols which is used in manufacture of polyurethane. The rest is converted to propylene glycol, which finds application in polyester resin, cigarettes/tobacco, pharmaceuticals, food flavours, perfumes and cosmetics. In India, due to the nonavailability and high landed price of polyols, the demand for PO has not picked up much as the demand is closely related to the demand of urethane foam products.

**Current licensed capacity:** NIL.

**Industry Review:** India presently is importing polyols and PO/PG based endproducts to meet the present demand. Two PO/PG plants are currently under implementation in Madras and are likely to be in operation by 1990 middle. The proposed capacity of these two plants would be 12,000 TPA PO each and approximately 6,500 TPA of PG each thus taking the total likely availability of PO & PG to 24,000 TPA and 13,000 TPA respectively. Both these plants would be utilising the propylene available from Madras Refineries Limited for their project. The present consumption of propylene oxide (in polyols & PG) and propylene glycol is approximatly 20,000 TPA and 9,000 TPA respectively. However, it is expected that once PO/PG is made available indigenously, growth rate will be much faster than the past since demand is supply driven.

**Forecast Demand* (TPA)**

| | 1994-95 | 1999-2000 |
|---|---|---|
| Propylene oxide (includes PO for PG) | 40,200 | 61,800 |
| Propylene Glycol (other than polyols | 18,100 | 27,800 |

* This assumes a growth rate of 15% until 1994-95 and 9% until the turn of the century.

**Forecast Capacity (TPA)**

| | P.O. | P.G. |
|---|---|---|
| Existing | Nil | Nil |
| Manali Petrochemicals | 12,000 | 6,250 |
| UB Petroproducts | 12,000 | 7,000 |
| | 24,000 | 13,250 |

Besides the above mentioned capacities which are already coming up, M/s. Petro Polyols have been issued an LOI for 12,000 TPA propylene oxide and M/s. Oswal Agro also have plans for 12,000 TPA propylene oxide and derivatives plant. Also as Government of India has fixed a minimum economic size of 25,000 TPA for polyols the two plants which a coming up in Madras could expand to this capacity and tak care of the future demand for PO until 1994-95.

## PHTHALIC ANHYDRIDE

**Introduction:** Phthalic anhydride is an important chem ical manufactured by oxidation of either naphthalene or C xylene.It has a wide range of application and in particul for producing plasticizers, which are used in poly vinyl chl ride products. Plasticizers are diesters of phthalic anhydrid with long chain alcohols and the most commonly used pla ticizer being dibutyl phthalate. In order to obtain product with a lower volatility and a higher boiling point, higher alc hols such as octyl, lauryl, cyclohexyl and benzyl alcohol ar used. The second major application of phthalic anhydride i in alkyd resins and for the paint industry and polyester resin for reinforced plastics and coatings. Alkyd resins are mad of reacting a fatty acid or an oil with one of the polyhydri alcohols and phthalic anhydride. A wide range of alkyd resin are being prepared depending on the percentage and the typ of oil/fatty acid used. Polyesters are manufactured by th esterification of phthalic anhydride with one of the polyhy ric alcohols such as glycol or glycerol. In the case of unsa urated polyester resins, some percentage of maleic anhydri is also added so that they can be further reacted with mon mers such as styrene and methyl methacrylate. This type resin is used mainly in the reinforced plastic industry. The also find a limited use in the coatings industry. Phthalic anh dride is used in various intermediates also. Terbromo phthal anhydride is used as a flame retardant in the preparation the polyol system for polyurethane foams. It is also used the preparation of phthalocyanine pigment and various oth intermediates like anthraquinones for the dyestuff industr

**Current Capacity (TPA):**

| | |
|---|---|
| 1. Herdillia Chemicals | 8,600 |
| 2. IDI Limited | 10,000 |
| 3. Durgapur Chemicals, West Bengal | 3,300 |
| 4. Thirumalai Chemicals | 25,000 |
| 5. Mysore Petrochemicals | 10,230 |
| 6. Shri Ambuja Petrochemicals, Hyderabad | 8,600 |
| | 65,730 |

**Industry Review:** As can be seen above, at present the are six units producing phthalic anhydride with a tot installed capacity of 65,730 TPA. Our total production 1988-89 is estimated to be around 55,000-60,000 tonnes. Th Durgapur Chemicals plants production has been highly err tic due to technical problems and non-availability of nap thalene which is the main feedstock. In the recent past th unit has hardly produced anything.

The growth in capacity at 13% per year in the past 12 years outplaced increase in production, which is at 11% per r. Therefore, the capacity utilisation has been lower. The functioning of Durgapur Chemicals has further contri- ed to the lower capacity utilisation. Consequently imports ich were to the tune of 1,000 TPA till 1985-86 have lined sharply. Presently, the small quantities of imports against advance licences for export of paints. Since 1986, h Thirumalai Chemicals expansion, our country has been ularly exporting phthalic anhydride. In 1988 Thirumalai emicals exported approximately 8,000 tonnes but with rais- feedstock prices and stagnant phthalic anhydride price, orts have considerably decreased. In the last three years acity addition has been up by 45% much higher than the rease in demand. The demand for phthalic anhydride, as ected by apparent consumption has been continuously reasing. Its average growth has been 11% per year. At sent the Government has granted letters of intent to Asian nts, North India Petrochemicals, Assam Industrial Devel- nent and Madhya Pradesh Audyogik Vikas Nigam total- ; 62,000 tonnes of capacity. Asian Paints is already plementing the project while the progress of others is not own.

**ecast Demand (TPA)**

| | 1994-95 | 1999-2000 |
|---|---|---|
| sticizers | 31,000 | 45,600 |
| nts | 28,300 | 45,580 |
| es & Pigments | 8,100 | 10,800 |
| yester Resins | 4,720 | 6,935 |
| scellaneous | 3,350 | 4,450 |
| | 75,470 | 1,13,365 |

**ecast Capacity (TPA):**

| | |
|---|---|
| xisting | 65,730 |
| sian Paints | 15,000 |
| | 80,730 |

hus with a forecast capacity of 80,730 tonnes, the fore- t demand of 75,470 tonnes by 1994-95 can very well be en care of. But further capacities would be required to er the demand by 1990-2000, which could be easily man- d with the expansion of the existing capacities since the vernment has fixed the minimum economic size of phthalic ydride plants at 20,000 TPA.

**nternational Scenario:** The estimated total world capac- at present is approximately 2.3 million tonnes with the sumption put at approximately 1.75 million tonnes lead to an excess capacity worldwide. Also some more capacities are planned to take care of the future market. M/s. IG Petrochemicals promoted by M/s. Mysore Petrochemicals has successfully launched a 100% export oriented unit in India with Lurgi, West Germany collaboration and has planned production starting in the third quarter of 1990. One would have to wait and see how it performs.

## ACETALDEHYDE

Acetaldehyde is an important intermediate in the manufacture of various chemicals, for example, acetic acid, acetic anhydride, glyoxal, pentaerithritol, VAM etc. Most of the manufacturers use it captively for producing the aforementioned organic chemicals.

Acetaldehyde is commercially produced either by dehydration on oxidation of ethanol or by direct oxidation of ethylene. However, in India, it is produced mostly from ethanol. There are more than twenty units producing acetaldehyde at present with an installed capacity of 1,37,000 TPA. The current demand for this chemical is put at approximately 85,000 TPA. Acetic acid and VAM are the two major applications consuming more than 80% of the total consumption. The projected demand for acetaldehyde is 1,23,000 TPA by 1994-95 and 1,65,700 TPA by 2000 AD (Source: AABIDA). A total capacity of 11,200 tonnes have been approved which if implemented would take the installed capacity to 1,48,200 TPA and it could take care of the demand until 1994-95. Further capacities would have to be created to meet the demand until 2000 AD.

## ACETIC ACID

Acetic acid is an important basic organic chemical. It has a wide range of applications. Acetic anhydride, VAM, Mono Chloro Acetic acid, esters and textiles are the major users of acetic acid. There are around 20 manufacturers of acetic acid with a total installed capacity of 83,000 TPA. However at present production has been only around 50,000 TPA. Indigenous production has been almost sufficient to meet the domestic demand. As in the case of acetaldehyde, ethanol has been the most preferred feedstock. However, there is a move to manufacture acetic acid using methanol as feedstock, which has not yet come through.

A major new application of acetic acid will be in the manufacture of purified Tere Phthalic Acid (PTA). Many units including Reliance, JK Petrochemicals, SPIC Aromatics Complex all plan to have PTA in their product mix which would nesessitate larger consumption of acetic acid as solvent. Keeping this in mind, the demand projected is 77,000 TPA by 1994-95 and 95,000 TPA by 2000 AD. A total of 90,000 TPA of acetic acid has been approved by Government by way of letter of intents but they have made little progress. Depending upon the implementation of these projects, new capacities need to be created in the future.

## METHANOL

The current demand for methanol is estimated at around 170,000 TPA. This demand is expected to grow to around 242,000 TPA by 1994-95 and touch a figure of 386,000 TPA by 2000 AD. The major sectors of consumption is in the manufacture of formaldehyde and DMT. However currently the use of DMT in polyester manufacture has been reduced considerably and hence consumption of methanol comes mostly from formaldehyde. Recently various parties have evinced interest in manufacturing acetic acid using methanol. Also a few polyacetal plants are being planned which will consume methanol. The present installed capacity is around 181,000 TPA. Additional licences have been given with a total capacity of 263,000 TPA. Thus, if these additional capacities are realised, it could very well take care of the future demand.

It is foreseen that there won't be any shortage of methanol in the future. However, if the present efforts for using methanol as an admixture with diesel succeed, methanol consumption could get a boost to the extent of 15,00,000 tonnes. There is also another product, Methyl Tertiary Butyl Ether (MTBE) which also could be used as an octane booster. Methanol is one of the major feedstocks for the manufacture of MTBE. Worldwide MTBE has become the preferred alternative to lead as an octane booster. In India also use of MTBE could pick up once the public become conscious of the environmental pollution problems related to lead. Thus Methanol use in new applications would go a long way to make it a high volume business in the coming years.

## DI PHENYL METHANE DIISOCYANATE (MDI) &
## TOLUENE DI ISO CYANATE (TDI)

MDI & TDI are products manufactured using aniline a
toluene respectively. Both MDI and TDI find applicatio
in the manufacture of polyurethane alongwith polyols. O
country, at present does not have manufacturing facilities
both these products and are being imported totally to me
our current demand. MDI finds its main application in rea
tion injection molding areas — for foam production. The
foams are designated as rigid foams and have got excelle
heat resistant properties. They also can be reinforced wi
various materials to enhance their properties. TDI is us
extensively in the manufacture of flexible foam products, wi
the largest market from the furniture and bedding indust
It is also used in seats for passenger cars, motor vehicl
etc. Semi rigid foam products also can be produced whi
find applications in packaging, paint applications, gaske
linings, etc.

It is estimated that the total demand for MDI &
together would be approximately 10,000 TPA which is lik
to grow to 20,000 TPA in the near future. The non avai
bility of these products and the high cost of import have be
major constraints. Till now, polyols, which is the other p
duct that goes in polyurethanes was also being import
However, in a few months from now they will be availa
in plenty. This could give a boost to the urethane indus
and consequently the consumption of MDI/TDI is a
expected to increase.

BIOCHEMICAL AND SYNTHETIC PRODUCTS LTD.
For your requirements of the following drugs and biologicals, please contact us at the address given below:

**BULK DRUGS**
PAS Sodium Powder • PAS Acid • Ethopabate • Metoclopramide • Trimethoprim I.P. • Amprolium Hydrochloride BP (Vet) • Rifampicin IP/BP • Methyl Paraben Plain and Sodium • Propyl Paraben Plain and Sodium • Aspirin BP/USP • Salicylic Acid.

**BIOLOGICALS**
Bacteriological Peptone • Liver Fraction I/II NF • Liver Concentrate Paste 1:20/1:40 • Liver Concentrate Powder Prot. Liver Extract 1:12/1:20 • Prot. Liver Powder 1:20 • Beef Extract Paste • Beef Extract Powder • Ox Bile Extract • Ox Bile Salt • Prot. Meat Extract 1:10 • Ovalecithin • Egg Albumin Flakes • Desiccated Liver • Yeast Extract • Yeast Extract Powder • Veg. Protein Hydrolysate • Extract Glycyrrhiza Concentrate • Extract Senega Concentrate • Ginger Oleoresin • Deglycyrrhizinised Liquorice • Prot. Stomach Extract 1:10 • Prot. Heart & Lung Extract • Prot. Spleen Extract • Dimethyl Hydroquinone • Papain IP/BP • Ox Bile Extract - NF • Ox Bile Salt - BPC • Mono-Ammonium Glycyrrhizanate.
Prices will be Furnished on request.

**C/o. Neo-Pharma Private Limited**
Kasturi Bldgs., 5th Floor, J. Tata Road, Bombay 400 020.
**Tel. No. 202 6613 / 202 7663 / 202 1764 * Telex No. 011-84182**

# Chemical News From Abroad

## EW BASF CHIEF DETAILS TRATEGY FOR EXPANSION

BASF's strategy for next year will ocus on integrating existing production tes while expanding through acquisi- on, the company's new chairman urgen Strube explained in Ludwig- hafen. But, he said, BASF will also uild up new production sites where overproportionate growth rates' appear o warrant it. In particular, he picked out ltamira in Mexico, where BASF has ecently acquired land.

Although no 'mega' deals are lanned, BASF is looking for 'comple- nentary acquisitions' in the fields of grochemicals and pharmaceuticals, ccording to the new chairman. Under lose scrutiny are agrochemical firms roducing herbicides, in which BASF lready has a strong position, as well as nsecticides, fungicides and biocides, where it is weak or has no position.

Strube added that, in the court of examining operations with a view to improving vertical integration, BASF may decide to divest some of its peripheral operations. However, nothing is planned in the near future, he said.

The company will also look at portfolio swaps to strengthen its core business. Strube suggested that Bayer could be the favoured candidate to take over BASF's printing plate and North American printing inks businesses now up for sale.

As BASF is planning to take over Bayer subsidiary Agfa's magnetic tape business, this could be regarded as an asset swap. The Agfa deal is being studied by West German cartel authorities.

Turning his attention to East Germany, Strube said that BASF will become the first West German company to acquire a production venture there if its plans to take over polyurethane producer Synthesewerk Schwarzheide (SYS) go ahead as planned.

The company has told the Treuhandanstalt, the organisation holding former state-owned industrial enterprises, that it is 'basically prepared to acquire SYS during the course of 1990'.

But Strube stressed that the takeover is dependent on BASF being exempted from responsibility for existing pollution at the site, which has not been modernised since the war.

Once this problem has been solved, he said, 'BASF is willing to invest considerable sums to secure production and infrastructure at the site, which employs 5000 people and has annual sales of DM600m ($369m).'

Strube also disclosed that Knoll, BASF's drugs subsidiary, has broken off talks with East German producer Arzneimittelwerk Dresden regarding a takeover. He commented: 'Closer examination showed that there were not enough synergies to warrant an acquisition.' However, there are still possi bilities for cooperation in individual product areas, he added.

## KERR-MCGEE SELLS SODA PRODUCTS

Kerr-Mcgee's chemicals subsidiary is to sell its soda products division to Searles Valley Acquisition for around $210m. The transaction will result in a non-operating after-tax loss of about $35m for the company.

The soda products division is one of Kerr-McGee Chemical's four divisions, which include pigments, forest products and electrolytic products. In 1989, soda products reported revenues of $193m, up from $182m in 1988. The division's assets include three chemical processing facilities at Searles Valley, California, producing soda ash, boron products, sodium sulphate and potash products.

Kerr-McGee refused to comment o the sale, which is subject to completio of financing arrangement and othe conditions requiring third party consents. However, the company is expecting "the transaction to be finalise expeditiously" said a spokesman.

Searles Valley Acquisition is a investment group led by D Georg Harris & Associates, a New York-base management buyout group specialisin in the chemicals and process industries

## MONSANTO DEFENDS LOW-CAL SWEETNER

The Nutrasweet Company, a subsidiary of Monsanto, has issued a writ fo libel and malicious falsehood against the UK newspaper **The Guardian.** The paper had published articles critical o the company's artificial sweetene aspartame.

The low-calorie sweetener, developed by G D Searle before its acquisition by Monsanto, was approved in 1983 for use in diet drinks and has been widely used since. The market is worth some £600m/year ($1080m).

Nutrasweet says the articles: 'Repeat old allegations which have been thoroughly investigated and dismissed by independent review bodies and government authorities'. In 1987 the US General Accounting Office investigated the entire regulatory process which led to the FDA's approval of aspartame.

'They concluded that the approval was conducted in a thorough and forthright manner,' says the company. A spokesman for The Guardian said the paper stood behind its reports, adding that it had not yet received the full details of the writ from Nutrasweet.

## EVODE ACQUIRES PVC FROM DEXTER CORP.

The Evode group is set to acquire two PVC businesses from US company

Dexter Corp. for $43m, of which $35m will be payable to Dexter on completion of the deal.

A further $8m will be paid in consideration for agreements preventing Dexter from competing with either business following the purchase. The acquistion is to be financed through the issue of US$preference shares placed by Kleinwort Benson North Amercia.

The two business, Alpha Chemical & Plastics Corp. and Mercer Product Co., have facilities in New Jersey, North Carolina, Florida and California, Alpha manufactures speciality PVC compounds of which over one-third are used in the food packaging and medical industries.

Mercer produces over 100 extruded and co-extruded wall and flooring accessory products. Their net assets are valued at around $18m and they made an operating profit of $4.6m on sales of $50.3m in 1989.

Evode believes that, as Dexter's businesses have a complementary product range and technology with its previous US acquisition Gary Chemicals, total group sales will increase to almost $180m/year of which two-thirds will be in North America and one-third in Europe.

Separately, Dexter has agreed to acquire Ciba-Geigy's preformed sealants business for undisclosed terms. The business is based in Madison Heights, Michigan and Kansas City, Missouri.

## DESOTO CONTINUES DIVESTMENT SPREE

Desoto has agreed to sell its consumer paints business to Sherwin Williams for about $80m. The deal is subject to shareholder approval.

DeSoto is also to sell its surfactant and emulsifer lines and facilities to Witco. Commenting on the possible sale of other business areas, the company said it was also negotiating the sale of its thickener technology business.

But in the meantime, it will retain its household detergent business, the company said. These are the latest in a series of moves that, taken together, represent a near-total liquidation of DeSoto, with proceeds to be distributed to shareholders. The company recently sold its industrial coatings business to Courtaulds for £135m ($246m).

Commenting on the latest sales, chairman and ceo, Richard R Misswar, said, 'We have spent the past four months evaluating a number of offers for various parts of the company's business.

Following the latest divestment agreements, Sutton Holding has dropped its hostile $50/share bid for DeSoto.

## HUNGARY UPS EFFORTS TO ENTER WESTERN MARKETS

Moves are underway in Hungary towards the transfer to a free economy bringing with it increased opportunity to enter western markets. The transformation of state-owned enterprises into joint stock companies is being planned by the State Property Agency (SPA). A list of 38 companies with good profit potential allegedly forming part of the first wave of privatisation was published recently in a financial daily in Budapest.

The list, which included the major chemical enterprise TVK and the Chinon and Gedeon Richter drugs firms, was subsequently claimed to be incorrect and considerable uncertainty over which companies will be privatised still prevails.

It is doubtful whether the government's privatisation package, due in the summer, will name companies to be privatised. Rather, it may state the criteria of the companies to be tackled firs and clarify real estate, law and ta issues.

However, Chinoin is known to hav retained a western auditing compan and an investment bank to help in it privatisation, which is due to take plac before the end of this summer.

Cooper & Lybrand confirmed it ha commenced the valuation of the asset of Gedeon Richter, which accounts fo over 30% of Hungary's pharmaceutica sales. As conditions for its privatisation over half of the stock in Gedeon Richter will be required to remain with Hungarian investors, and the foreig investors must themselves be drug companies.

Although net income has bee increasing over the past years, Gedoe Richter's post-tax profits dropped t Forint490m ($7.7m) in 1989 from peak of Forint 795m in 1985. It export almost 80% of its output, with over 30 of this going to the USSR. Howeve the proportion of exports heading to th West has increased from 24.4% in 198 to 34.7% in 1989. Gedeon Richte already had R & D agreements wi Takeda and Koya of Japan and ha signed a research cooperation agreemen with American Home Products fo developing drugs in the CNS, cardio vascular and anti-inflammatory field

Most recently, the US fertiliser trade Tectrade International acquired a 10 stake in Nitrogen Muvek, formerly th Pet Nitrogen Joint Co. of Varpalot southwest of Budapest.

Tectrade is believed to have pai Forint 160m for the stake from Chem olimpex, which led an all-Hungaria consortium which acquired the com pany in March this year.

Meanwhile, the Hungarian chemic industry association has applied to jo the European federation of chemic industry associations, Cefic, an cording to Dr. Hugo Lever, Cefic rector general, may join, along with Polish counterpart, within the next ve years. At present, according to ever, these associations do not really present their respective national chem- al industries.

However, a broader representative dy, the association of Hungarian emical works, was established on 5 ne, which will undertake lobbying and blicity work, as well as representative dy, the association of Hungarian emical works, was established on 5 ne, which will undertake lobbying and blicity work, as well as representing e industry in economic affairs, said a okesman for the association. The orig- al association is expected to dissolve the future, he added.

Hungary also hopes to become part the EC, first through gaining asso- ation status by 1 January 1992 and en becoming a full member by 1995. ccording to prime minister Josef ntall:'We will do everything in our ower to participate in the realisation of uropean union'.

## K DELAYS GREEN EGULATIONS

Introduction of integrated pollution ontrol (IPC) in the UK, as part of the overnment's Environmental Protection ill, has been put back three months. avid Trippier, minister of state for the nvironment and countryside said, that C would now begin on 1 April 1991 r certain categories of process, with rther categories being phased in from April 1992.

The delay is the result of the Bill's ow passage through Parliament. It is ot now expected to come into the force ntil October this year, which will leave o little time for consultation with dustry, said Trippier. The delay will lso allow more time for training within er Majesty's Inspectorate of Pollution HMIP), he added.

With the use of IPC in the UK, a scheme of cost-recovery charging is being introduced, whereby companies will pay an application fee as each process is submitted to HMIP and IPC authorisation. An annual charge will also be made for holding each authorisation, to cover costs of compliance monitoring.

The Department of the Environment has now published a consultation paper on the detailed operation of the scheme. The paper also sets out charging schemes for local authority air pollution control of less polluting plants. Comments are required by 21 September.

Charges will be linked to the number of components within each process. Thus large and complex plants will pay more than small businesses. It seems likely that charges will be around £1800/component ($3240) for application, and £400/component for the annual charge.

## DU PONT/MERCK MERGE DRUGS

Continuing the recent trend to create major pharmaceutical mergers, Du Pont and Merck have agreed to form a new worldwide drugs company, with first-year sales estimated at $700m.

Du Pont Merck Pharmaceutials Co, to be launched in January 1991, will combine Du Pont's entire pharmaceutical and radio-pharmaceutical imaging agents businesses, while Merck will provide development funds, industry expertise, cash and certain marketing rights to several of its prescription medicines.

While Merck will benefit significantly from increased R & D capability, the move will give Du Pont the global resources required in marketing and research to allow it to join the major worldwide pharmaceutical players.

The new company's $230m R & D budget proposed for 1991 is to increase to over $400m im 1995, making it considerably larger than the budget Du Pont had projected for its own pharmaceutical operation. However, the new venture's R & D effort is not expected to produce significant commercial results until the late 1990s.

An initial priority of the venture will be to build up its European business base by marketing some current Merck pharmaceutical products and increasing its sales forces. Du Pont is to retain its other health-care division — diagnostic products, biotechnology products and X-ray products — with annual sales of over $1bn.

## ICI's UK FERTILISERS ACQUIRED BY KEMIRA

ICI announced it has agreed in principle to sell its UK fertiliser business to Kemira, which already has a UK production site at Ince, near Chester. The ICI production sites at Severnside and Leith and the eight liquid fertiliser manufacturing locations of the ICI subsidiary Britag will be transferred to Kemira. The complex and associated head office facilities at Billingham will close.

The deal, which is subject to regulatory approval, will result in Kemira having around one-third of the UK market. A Kemira spokeswoman said the enlarged operation would definitely be profitable in the short term and had good long-term prospects'.

ICI hopes to complete the deal by the end of 1990. The value of the consideration was said to be £50-100m ($91-182m). The ICI six-month results contains an extraordinary charge of £100m (net of tax) to cover the losses on the disposal of the fertiliser business. Meanwhile, ICI reported six-month results below most expectations. Net profits, depressed by the fertiliser extraordinary charge, plunged 40% to £733m

## AST GERMANY SET TO OLLOW EC MERGER RULES

Two senior East German ministers ave assured the EC competition commissioner, Sir Leon Brittan, that the East German minister of the economy, Gerhard Pohl, urging the government not to permit anti-competitive mergers. Following this, Britain met for talks in Berlin with Pohl and the East German prime minister Lothar de Maiziere, who said they considered it was in the interest of their country to apply EC competititon rules. There is now to be direct contact between Commission competition policy officials and their East German counterparts.

The Commission approved simplified and more flexible procedures for the notification of cross-border mergers within the EC, and published guidelines defining which kinds of mergers will be covered by the new regulations. The regulations were first adopted by the internal market council in December last year after more than 15 years of discussions and are due to come into effect on 21 September 1990. Under the regulations, the Commission will vet all mergers if the combined turnover of the companies involved amounts to more than Ecu5bn ($6.3bn) and the total turnover attained individually within the Community by at least two of the companies concerned is over Ecu250m. The Commission will not vet mergers where each company obtains less than two-thirds of its total turnover in the EC within one member state.

The simplification concerns the notification form, through which companies are required to inform the Commission of a proposed merger covered by the controls not longer than one week after signing a protocol agreement. The companies will now not have to provide full details of market shares in individual countries if they are not relevant to the overall competitive situation surrounding the deal. It was considered this sort of information would be difficult to obtain and the system would prove complicated and almost unworkable. The Commission has also indicated that if a joint venture did not prove to be anti-competitive, then any ancillary arrangement connected to the venture, such as licensing or R & D collaboration agreements, would also be allowed without any further notification. The new guidelines explain the distinction in the regulation between 'concentrate' and 'cooperative' joint ventures. Instead of being controlled by the new regulations, so-called 'cooperative' joint ventures will still be vetted through Articles 85 and 86 of the Treaty of Rome, previously criticised for being too vague.

## BALLOT CALLED AT ICI

ATICI, union leaders for manual workers have voted to call a ballot on industrial action after rejecting the company's 9.8% offer. Around 22,000 blue-collar workers at ICI will be asked whether they are prepared to take part in strike action, but the outcome of the ballot will not be known until 29 August, said Chris Darke, of the industry union MSF. A ballot on strike action was last called in 1986, but no action was taken then or at any other time in ICI's history, an ICI spokesman said. ICI has said it will not improve the offer. Neither Darke, nor Alistair Hatchett from Income Data Services expects strike action to result.

Meanwhile, both Rhone-Poulenc and Glaxo are due to settle claims in the UK. At Glaxochem, a 9.8% increase has been awarded on top of a 19.79% increase from a bonus consolidation in January. Rhone-Poulenc's claim is being handled in two parts. Employees at Norwich have accepted a 9.5% increase, while there is still resistance to a 9.8% offer at Dagenham, said Hatchett.

## AKZO IN TURKISH JV

Akzo is establishing itself in the Turkish coatings market in a venture similar to its Hungarian coatings venture with TVK, which recently started up production. The Netherlands-based company is taking a 51% holding in Kemipol, forming Akzo Kemipol, which from 1 August will focus its efforts on the rapidly growing coatings market in Turkey.

Kemipol, with annual sales of Dfi 25m ($13.7m), has a production capacity of 4000 tonnes/year, of which 30% comprises automotive coatings and 70% industrial coatings. All the product is marketed with Turkey, where the 4400 tonne/year demand for automotive coatings is expected to increase to 11 000 tonnes/year by 1995, an Akzo spokesman said. The market for car refinishes and other industrial coatings is also fast-growing, he added. Kemipol's production facilities in Izmir are modern and free from environmental problems, said the spokesman. New production facilities are planned by the venture to meet growing demand. Akzo will bring in capital to the venture, as well as know-how and technology.

## ENIMONT FORMS JV WITH BORREGAARD

Enimont, through its subsidiary EniChem Synthesis, and the Norwegian group Borregaard Industries have reached an agreement for the formation of a joint venture company.

The new concern will be engaged in the manufacturing, marketing and sales of guaiacol, veratrol and food additives such as vanillin, ethyl vanillin and derivatives. Its head offices will be based in Norway and the production plants will be in Norway and Italy. Enimont says the new company will be co-leade in the world market. It is also planning guaiacol/veratrol plant in Ravenna Italy, and a synthetic vanillin and ethylvanillin plant in Sarpsborg, Norway Both plants are to be onstream in lat 1991. A number of additional new products are also under development.

# Chemical Markets Abroad

## OBAL RUSH FOR ETHYLENE

nagine life without water. Well, 's like imagining the petrochemical stry without ethylene. Without it, rest is academic.

erived from either crude oil or gas, lene drives the production of those e tangible products, like omnipre- plastics (polyethylene and polyvi- chloride) and synthetic fibres (nylon polyester).

or nearly eight years the world's nical industry has benefited from a bination of sustained world eco- ic growth and its own, early 1980s, me of the burn-factor. Overcapac- — industrial middle aged spread — set in during the 1970s, by the early s of the 1980s, it was evident that nalisation was required if the indus- were to survive.

ruly abysmal performance — even so-called leaders, such as ICI, SF, Dow and Du Pont were losing ey hand over fist — forced tough sions. In Europe, of the 64 ethylene kers (plants) that had been in ope- on at the beginning of the 1980s, 24 been shuttered by 1984.

he slimming regime — which cked out some 30 per cent of the ld's total capacity — worked, and is continued to work. But what has pened since? The low-calorie me-getting more out of less-has me yesterday's in-thing. Starved of stment for years, the world's main- petrochemical industry started to n itself up. A proliferation of expan- s tuning-ups and straight binges (i.e. plants) was announced during 1988 1989.

rue to form, the industry's invest- t plans only emerged at the top of siness cycle. The memories of the days of overcapacity had prevented established producers from even contemplating investment in their key feedstock — ethylene.

At one point — if all those announcements were to be taken at face value — it really did look as though the ethylene industry across the globe was set to inflate its capacity from about 1988's 56 to some 75m tonnes by 1992. In just US and Western Europe, new ethylene capacity announced amounted to justover 10m tonnes. Add to that plans to build in South East Asia and Japan (circa 6.5 tonnes), and the running total notched up to some 16.5 tonnes — 30 per cent of existing worldwide capacity.

Overindulgence? Maybe if you believed it. The strategy was clear-for corporate survival, building capacity was the only Darwinian Way. Revival-survival. In Europe during 1988, at least 10 plants were announced, some indicating a clear change in the way industry was viewing its future. Competitors were starting to join forces, sharing both the risks and the expected profit. The combination of Finland's Neste with Belgium's Petrofina — in their Finaneste joint venture — was the first of such moves, which at the time were regarded as controversial by the majority of the partner's competitors.

But no sooner had the dust settled on that announcement than a whole host of other plans emerged. Some seemed, and were, for real, but others were attempts at pre-empting rivals, or moves to halt others joining the building spree. Virtually every one of Western Europe's top 10 ethylene producers announced intentions either to lift existing capacity or to build new plants.

As the building euphoria gave way to a more realistic appraisal of sustaining good levels of profitability, however, some strategic alliances began to emerge. West Germany's BASF had announced plans to go it alone and build an ethylene plant at Antwerp. But just months ago it emerged that BASF had negotiated a product-sharing deal with Dow, obviating the need for Dow to proceed with its plan to build a new unit at Terneuzen in the Netherlands. Other producers have quietly revised plans-pushing back scheduled commissioning dates. As a recently published report on the international ethylene industry noted: "Chances are that the bulk of the balance of announced projects will slip quietly in to the 1994-1996 timeframe".

In the US and Canada Dow, Phillips, Quantum, Westlake Polymers and Taiwan's Formosa Plastics all announced plants that would be on stream by 1993-3.8m tonnes in total or 15% of 1989's effective capacity. In Japan, six producers or combinations of the same were jockeying for the green light for new plants.

If that alone were not enough, a few other players had joined the club since the late 1970s and early 1980s. North African (read Libya) and Middle Eastern (notably Saudi Arabia and potentially Iraq and Iran) producers had come into the picture, as had Taiwan, South Korea, Thailand and Indonesia. Many of these countries were strategically expoliting their own ace cards —namely abundant supplies of crude oil and gas, available at prices that should ensure a significant competitive edge against the established developed world's main players.

## STYRENE QUIETENS AS ARCO OUTAGE IS ABSORBED

Styrene buyers have reluctantly agreed to Q3 contract levels of DM1730/tonne ($1069/tonne), the same level as Q2. Agreement was initially reached in West Germany almost two weeks ago. Buyers throughout Europe have gradually settled at these levels, spurred on by the effect on spot prices of Arco outage, which has removed for an unspecified period 5% of world styrene production. Consumers had been pushing strongly for a reduction in Q3 contract numbers. The DM45/tonne reduction in the European Q3 benzene contract price and the easing of the styrene shortages, as European plant outages ended, had encouraged consumers to believe that lower prices and improved product availability would be a feature of the second half of 1990. The Arco outage swiftly changed the parameters: styrene producers believe that the new contract price fairly reflects the acute shortages without taking undue advantage of the situation.

Currently, European spot prices are in effect a net-back on the US Gulf spot price. In the US, spot prices are said to be in the area of 50-55 cent/pound ($1100-1170/tonne). With European spot prices of $1100-1160/tonne fob, prices do not appear to be heading for the stratosphere. The US contract price for August is believed to be $42 1/2 cent/pound up from $40 1/2cent/pound in July.

The relative stability is perhaps due to stable, even soft demand for derivatives and around 460,000 tonne/year of new capacity, now onstream in Taiwan and South Korea. In Europe, the spot market is fairly quiet. Spot transactions at prices up to $1160/tonne are believed to relate to the Arco outage, but most transactions may be inter-producer, and shipments of styrene to the US are said to be under way.

Although the process unit was undamaged, the length of outage is still unspecified while the accident is under investigation by the Occupational Safety and Health Administration. The company continues to produce product at its Pitsburgh plant, which accounted for only 15% of Arco's US styrene production.

## SODIUM CHLORATE UP 7%/YEAR

Sodium chlorate in the US is projected to expand by 7% annually between 1990 and 1994, to 820,000 tonnes, valued at $480m, according to a recent study, Sodium chlorates, published by Freedonia. The pulp and paper industry will continue to account for 93% of demand.

Although the US accounts for nearly two-thirds of North American sodium chlorate demand, almost two-thirds of North American production capacity is located in Canada, partly due to lower electricity costs.

Freedonia forecasts that sodium chlorate consumed by the US pulp and paper industry will expand 7.4% annually, to 771,000 tonne/year until 1994. This expansion is driven by the pulp and paper industry's attempt to find an environmentally safe alternative to chlorine as a bleaching agent.

The pulp and paper industry converts sodium chlorate to chlorine dioxide, a cost-effective bleaching agent which sharply reduces the generation of chlorinated hydrocarbons in pulp mill effluents.

Other markets for sodium chlorate comprise only 7% of demand and include derivatives, herbicides and defoliants. The most important derivative is ammonium perchlorate, used almost exclusively as the oxidiser in solid rocket propellants. Water treatment applications are small but fast-growing.

Driven by the decline in the use of chlorine for pulp bleaching, sodium chlorate demand grew by 10 per cent in 1989 and similarly strong growth is expected for 1990. This has led to major new capacity plans, which some observers believe may lead to excess capacity within the next few years. Freedonia, however, believes that with pulp and paper industry demand rising sharply, production facilities will be strained to meet demand through the early 1990s.

Freedonia draws attention to the hig level of concentration in the industr The top four producers, Kema Nor Kerr-McGee, Pennwalt (Elf Aquitain and Occidental control two-thirds production and sales. Nobel Industri is attempting to purchase Stora Kem a move which may be disallowed anti-competitive grounds as it giv Nobel Industries over 90% of the Swe ish sodium chlorate market.

Stora Kemi, in its turn, is attemptin to buy out Olin's 49% stake in its Nor American joint venture company Al Olin, which would lead to even furth concentration. If the deals go throug Nobel Industries would own over 40 of North American sodium chlor capacity.

Longer term, the use of hydrog peroxide and oxygen bleaches expected to slow down the growth sodium chlorate, seen by many obser ers as an interim solution.

## COASTAL PRODUCES MTBE FOR ARCO

Arco Chemical and Coastal Refin have announced plans to restart MTBE unit at the Coastal site in Cor Christi, Texas. Work has begun and unit is expected to resume product in early August at a rated capacity 12,000 barrel/day (465,000 tonne/ye equivalent to around 44% of the MT production lost in the Channelv explosion.

The Coastal unit was operated behalf of Arco from 1985 to early 19 processing tertiary butyl alcohol (TB produced at Arco's Bayport plant MTBE. Arco is investigating all po bilities but, apart from the Coastal pl there appears to be very little opport ity either in the US or Europe to cess the available TBA into MTB

In Europe, Arco's plant at Bo near Rotterdam, has been debo ked. Before the recent shutdown, the cial plant capacity was 370,000 ne/year, although the plant was proing ahead of that level. The new cial capacity is 500,000 tonne/year, ough this is not currently being ieved. The Fos plant has been debotecked from 420,000 tonne/year to ,000 tonne/year. This plant is still vn for routine maintenance but the npany hopes it will restart by the end July.

he European market has been very t for product because of these shutvns and strong European demand for ane in unleaded products. Arco has oped some product to the US but il Fos is back up, availability will be y limited. Premium gasoline prices around $259/tonne, suggesting a opean contract price of MTBE of re than $410/tonne. Spot prices are around $450/tonne fob.

## W SUMMER ACTIVITY FECTS SHIPPING RATES

he shipping market remains ressed on the North Sea and Meditinean routes this month. Operators ort a thin presence of spot cargo on ARA to UK east coast route, and tract business is also lacklustre. To ie extent, this is attributed to a seaal slowdown in activity, despite the of the maintenace turnarounds ch had particularly depressed busis in May. A 3,000 tonne easy chemis parcel from Rotterdam to Tees uld be transported at Dfl 20/tonne ($10-11/tonne).

he NWE to Med market is similarly ressed, although tonnage availabilis said to be reduced as a result of ller ships being moved from these es to Transatlanic or Far East routes nprove utilisation over the summer nths. Some very high rates were said nave been paid from NWE to the d to meet particular requirements in general, rates are said to be in mid-$20s/tonne for a 3,000 tonne parcel and around easy chemicals. Hopes have been voiced for a recovery which may be felt as early as August, with expectations of an upturn focused by one operator on the hazardous, phenol and stainless steel speciality cargoes.

Although the Baltic is in a period of low summer activity, rates appear to have firmed a little. One operator believes this is because of a reduction in the tonnage available. Soviet cargoes appear more in evidence and rates are $21-22/tonne for a 2,000 tonne parcel of dam, with prices of around $26-27/tonne paid for 1,000 tonne parcels. The effects of the Arco outage are beginning to be felt on westbound Atlantic routes, influenced also by the increased shipments of aromatics to the US which were already a feature prior to the Channelview explosion. Up to 25,000 tonnes of aromatics, mainly toluene and some xylenes, have been shipped to the US over the past weeks. Increased enquiries for MTBE and styrene shipments are also being seen.

The availability of MTBE in Europe is limiting the prospects for US shipments, but styrene availability is expected to lead to further business. Rates for 2,000 tonne parcels increased from $20-21/tonne in June to around $24-25/tonne in July. Larger cargoes of 5,000 tonne of easy chemicals from Rotterdam to Houston would raise $22-24/tonne. Eastbound rates are stable at $27-31/tonne for a 5,000 tonne parcel and $29-33/tonne for a smaller 2,000-3,000 tonne parcel.

February was also the last strong month for spot business on the Far East routes. After the disruptions caused by holidays in the Far East in May, the market has recovered this month, but oversupply of tonnage remains. The vessel fleet assigned to the Pacific routes is currently below normal levels in response to the thin spot business available. One operator notes that Arco's Channelview outage has lead to new disruptions, 'creating some space for carriers', due to the cancellation of styrene shipments to the Far East. The rate quoted for a 5-10,000 aromatics shipment is high $30s-low $40s/tonne; mid-$40s/tonne for 3-4,000 tonne parcels. The premium on the Suez route, available in late June and early July, has disappeared, and the rates quoted for a 5,000 tonne parcel from NW Europe to the Far East through Suez is $53-54/tonne.

## EC-CHINA SACKS DUTY

Officials at the European commission have decided to impose a temporary anti-dumping duty on imports of woven polyolefin sacks from the People's Republic of China. Imports of Chinese sacks stood at 8094 tonne in 1985, 14,190 tonne in 1986, 15,192 in 1987 and 13,796 tonne in 1988.

In 1985, the community industry showed a profit of 9.4% in 1986, profitability was still at 5%., By contrast, after a marked increase in imports of Chinese sacks, losses stood at 10% in 1987 and were still about 0.6% in 1988, notes the Commission. Brussels has calculated that a 43.4% rate of duty, applicable to the preclearance free-at-community-frontier net price should redress the damage caused to European producers. Chinese producers have time to inform the Commission of their views.

## BASF RESINS FIRE

BASF Alkyd and acrylic resins plant at Dana Avenue, Cincinatti, has been closed by a fire on the afternoon of Thursday 19 July. The materials are used in resins and coatings, both internal and external, for food and beverage containers. BASF says it has other facilities in North America from which customers can be supplied and does not anticipate 'any significant problems in servicing its customers'. BASF acquired the Cincinnati facility with the purchase of Inmont's business in 1985.

# Biotechnology

## LILLY SUED ON PROZAC 'SUICIDAL' SIDE-EFFECTS

Eli Lilly, the US manufacturer of the potential blockbuster antidepressant Prozac (fluoxetine), faces a $150m law suit alleging that the drug made a patient suicidal. The suit alleges the drug caused a patient to commit self-destructive acts and attempts at suicide when no history of this behaviour was observed. When the drug was withdrawn from the patient the self-destructiveness abated. Although Lilly will not comment on the litigation, a statement says that clinical trial and postmarketing experience does not suggest that a causal relationship exists between Prozac therapy and this type of suicide in depressed patients is well established and packaging literature (data sheets) for anti-depressants includes precautionary statements about this risk.

The drug's suggested association with suicide was first reported by Dr. Martin Teicher, a psychiatrist at McLean Hospital, in Belmont, Massachusetts, in the American Journal of Psychiatry in February. Teicher identified six individuals who had developed 'intense, violent suicidal thoughts'while taking Prozac. In an interview with ECN, Teicher stressed that the results were only suggestive of a connection. Teicher believes that the drug is a valuable medication but believes that in a small proportion of patients it can lead to a serious deterioration of their condition.

He estimates about 3.5% patients suffer an intolerable state of inner restlessness which can lead to suicidal thoughts. Other patients suffer a mania which can lead to promiscuity or excessive spending. Teicher believes that some patients on Prozac were seen by the prescribing physician too infrequently, but the drug can be used with confidence if doctors are aware of this problem.

Prozac is a selective 5HT (serotonin) reuptake inhibitor. Since its launch in the US in 1988, sales have soared from $125m to an estimated $700m this financial year. Some analysts have predicted sales to plateau at levels as high as $2bn/year. Prozac quickly gained favour with physicians because it does not suffer from any of the inconvenient side-effects associated with the existing class of drugs used to treat this condition. It also has no detrimental effects on cardiac function, which can be serious in overdose.

Prozac also appears to cause a weight loss in patients, viewed as mildly beneficial. Lilly is conducting trials on Prozac for weight loss as a separate indication. Depression is diagnosed when a patient suffers from serious disturbances in mood, leading to a state of despondency and irritability. Often, an associated feature is an inability to experience any pleasure in life, a condition known as anhedonia.

## SCIENTISTS REPORT AIDS INHIBITION

US scientists have discovered a class of compounds which block the infection of cells by the human immunodeficiency virus type 1, HIV-1, laboratory studies. Infection by HIV-1 is initiated when its envelope protein (gp 120) binds to a receptor, the cell surface glycoprotein CD4. In a paper in Science (20 July), Robert W Finberg and co-authors report that this process can be blocked by a group of small molecules, N-carbomethoxycarbonyl-prolyl-phenyl-alanyl benzyl esters (CPFs).

CPFs may be an important candidate drug for the treatment of Aids, according to the scientists. Clinically, the compounds are expected to inhibit HIV infection and to reverse any immunosuppression or toxicity due to soluble gp 120. The paper highlights the potential therapeutic importance of one of the compounds, CPF (DD). which prevents the spread of HIV-1 from a sm
number of infected cells to a larger p
ulation of uninfected cells.

The research was carried out at H
vard Medical School's Dana-Far
Cancer Institute and Department
Chemistry. In an earlier paper
Science (29 June), scientists from
Roche Institute for Molecular Biol
in Nutley, New Jersey, reported
identification of a human cellular p
tein that interacts with the HIV Tat p
tein. The finding could lead to a n
approach to blocking HIV replicatio
cells.

The researchers describe a compo
termed Tat-binding protein 1 (TBP
found by screening a cloned D
library with Tat, for protein with s
pression activity. The Tat protein is
of three HIV proteins which regulate
replication of the virus in an infe
cell, the others being termed rev and
It is believed that Tat and rev prot
are essential for the replication of
HIVZ. The Roche scientists specu
that TBP-1 may be one of many c
lar factors which modulate Tat func
and that an understanding of the m
anism could provide a means of con
ling the process, leading to a pos
way of blocking transactivation a
cellular level.

## TRIALS PLANNED FOR N AIDS VACCINE

The Oxford, UK-based biotech
pany British Bio-technology
intends to start clinical trials of p
tial Aids vaccine in the UK in
tember. Phase I trials in healthy h
volunteers will be held at the Ham
smith Hospital in London, in con
tion with the Medical Res
Council's (MRC) Aids program

The vaccine is based on BB's
prietary technology for prod
immunogenic 'virus-like part
(VLPs). These are grown in yeas
and resemble viruses in shape an

do not replicate. The technique was ginally developed by BB over three rs, centering on work done at Oxford iversity. The vaccine, known p24-P, expresses the p24 protein, a n-mutating core protein of the HIV. e vaccine's active agent was proced by isolating the gene which resses the p24 and introducing it into DNA of the VLP-producing yeast. e initial trials will measure the qual- and duration of immune response. e MRC has, however, stressed that cedures are in place such that no unteers in the trial are mistakenly ught to have HIV infection. The urities firm Shearson Lehamn Hutton LH) has speculated that in the discusns with potential partners for comrcialising the vaccine. This is due to llcome's pre-eminent position in ds therapy and existing vaccine business. However, SLH notes the vaccine ild represent additional potential npetition for Retrovir, if it showed mise in halting the progression of the ease among sufferers.

## DEVELOPS POLISH FRAN- HISE BUSINESS

Smithkline Beecham (SB) is to ense its best-selling antibiotic Augntin (Co-amoxiclav) to the Polish rmaceutical company Polfa Taromin. Intermediates for manufacture l be supplied by SB. This is the first e that Augmentin has been manufaced under licence in Eastern Europe. also hopes that a similar agreement another antibiotic, Timentin (Ticarin), will follow in the near future.

Augmentin, a broad spectrum, claanate potentiated penicillin, has been istered in Poland for two years. Until v it was supplied direct from SB in UK . World sales of the drug ched £300m ($540m) in 1989, half which derives from the US. SB aims establish a base from which to sell drug in the Baltic states using Taromin's existing business links in that ion.

FOR YOUR REGULAR REQUIREMENTS OF

**WHITE BEESWAX**
**YELLOW BEESWAX &**
**HONEY**

*PLEASE CONTACT MANUFACTURER :*

**MEHSONS CHEMICALS PVT. LTD.,**

P.O.B. No. 121
KAMLA BHAWAN, MADARI GATE,
BAREILLY 243 001 ( U. P. )
PHONES : 76517, 77359, 74150, 76526
TELEX : 0577 209 ME IN
CABLE : VEGLAMUKHI - BAREILLY

For Your Requirements Of:

**BENZYL CHLORIDE**
**BENZOYL CHLORIDE**
**BENZO TRI CHLORIDE**
**BENZALDEHYDE**

Contact Manufacturers:

**Shubham Aromatics Limited**

Factory:
Birlagram,
NAGDA (MP) 456 331
Phone: 283/104

Regd. Office
29, Bank Street, Ist Floor,
Bombay 400 023.
**Phone: 2862453/2863021**
**Gram: "METALDIST"**
**Telex: 011 - 6554 MINA IN**

# Technological Scene Abroad

## TPL CUTS CRACKED FEED GAS TREATMENT COSTS

Italian process contractor Technologie Progetti Lavori (TPL) has patented a novel scheme for cold box treatment of cracked feed gas in ethylene plants. The new scheme, says Marcello Picciotti, vice president for technology and marketing at TPL, 'will reduce both investment costs and energy consumption at the heart of the cold section'.

In conventional designs, the three main plant units — chilling, demethanising and deethanising — are arranged linearly; in the new TPL scheme, these units are arranged in a series/parallel loop. The arrangement stems from the concept of 'progressive separation of cracked feed gas (CFG) along the process unit sequence'.

At the chilling train, in which fractionated condensation occurs, operating conditions are created so that condensates can be withdrawn at a selected CFG temperature/composition, to be deethanised in a stripper deethaniser. Remaining CFG is further chilled, and condensates sent to the demethaniser system; deethaniser overhead is also sent to the demethaniser. The deethaniser bottom is sent to propylene purification, while the demethaniser bottom, free of C3 components is sent to the ethylene purification.

The efficiency of the improved arrangement, says Picciotti, is much higher than the conventional process scheme. With the new arrangement, the refrigeration requirement is only 120 kWh/tonne of ethylene, whereas before, typically 160-200 kWh/tonne was needed. Efficiency is thus increased by 30-40%.

According to Picciotti, the process has been fully simulated on computer to prove its validity. He believes it will be suitable for use only in new ethylene investments as it is highly integrated with the demethanising system. Although it can be used with CFGs from cracking of both liquid and gas feeds, Picciotti believes strongly that the scheme is specially suited to the separation of gas from ethane cracking.

TPL is the owner of leading technology for cracked feed gas processing in ethylene plants, with a string of projects over the last 20 years. The technology has been updated several times and is now in what the company terms its third generation. The improvements have contributed to progressive reduction of total compression power and increased reliability, says Picciotti.

The third generation plants, the first of which is currently under construction for Enimont at Brindisi (400 000 tonne/year), feature two medium-pressure demethanisers and an integrated deethaniser/C2 splitter with hydrogenated deethaniser overhead online with the ethylene splitter. Compression power requirement is below 0.6MW/tonne of C2, down from the 0.7MW and more of first generation designs. The process scheme is still the conventional linear one, however.

## PURITY UP AT FIRST CHEMICAL

First Chemical Corp, part of First Mississippi Corp, has improved its production process for di-tert-butyl dicarbonate to enable purities of better than 99% to be achieved. This, says Bill Arnold, marketing manager for the product, will allow the company to sell to all the market and not just a section of it as now. The speciality chemical is an intermediate used as a reagent for tert-butyloxycarbonylations in the pharmaceutical and electronics industries. Major use is in amino acid-peptide conversions which, says Arnold, are growing in importance in the pharmaceutical industry. In the electronics area, photoresists are the main end product are using the intermediate. Arnold puts th market in the US at around 5-10 tonne/ year and at 20 tonne/year for the rest o the world.

Production is based at Tyrone, Pennsylvania, in the fine chemicals comple of Quality Chemicals, a subsidiary o First Chemical. Although proces improvements have been revealed, the are at the purification stage, where method new to the company is being pu into implementation.

## OSHA TO TIGHTEN US PLANT SAFETY

The US Occupational Safety an Health Administration (OSHA) ha proposed new regulations designed 'prevent catastrophes or minimise th consequences of accidents in industrie with processes using highly hazardou chemicals'.

The move follows two US diaster the recent explosion at the Arco Hou ton facility, where 17 people we killed; and the fire and explosion at Phi lips Petroleum's plant in Pasaden Texas, where 23 people were killed ar around 100 injured.

Described by OSHA as proce safety management (PSM), the prop sals would require employers to car out process hazard analyses at the plants. They would form the basis o thorough, orderly, systematic approa for identifying, evaluating and contr ling processes involving highly haz dous chemicals', according to OSH

The hazard analysis would aim determine where problems might occ and take corrective measures to impro process safety. A plan would be ma of actions to be taken if safety contr or redundant systems failed.

Employers would be called upon take the following actions: compile p cess safety information; train worke ntain safe operating procedures; ure that contractors work safety te; issue 'hot work' permits; main- the mechanical integrity of equip- t; manage process changes; carry incident investigations; develop rgency action plans; and conduct pliance safety audits.

he proposals would primarily apply manufacturing industries such as micals and allied products, and oleum refining and related areas. er sectors would include liquid nat- gas production and electricity and er services, according to OSHA.

ome 28 000 facilities with 2.2m staff ld be affected by the proposals.

## ENCH BOOST R & D

rance's Research and technology istry is launching a 'mobilisation gramme' to develop the chemical ineering sector. The aim is to boost nology transfer from large compa- s to small-and medium-size ones.

his will be done by building up a vork of public and private research tres to coordinate research. Ministry for this sector will double next year n the 1990 level of FF40m ($7.2m). number of research grants will be eased from 25 to 75 in 1991.

ilbert Gaillard, president of Hoechst nce and chairman of the French mical engineering association, has n asked to establish a development eme for France's areas of expertise hemical engineering.

## RONG GROWTH FOR SAFER, EAPER BIOPESTICIDES

he use of living species to control icultural pests looks set for strong wth as they are relatively cheap to elop and safe in use. They are, how- r, unlikely to challenge the market ninance of chemical pesticides ing the coming decade. In its latest technology impact report Frost & Sullivan forecasts that the most dramatic increases will take place in **Bacillus thuringiensis (BT)** toxin products, which are mostly inactivated spore preparations. BT toxins currently hold a large share of the biopesticides market in the US.

The report lists nine other microbial pesticides, but says that commercial introduction of other microbial agents for insect control are perhaps 10 to 20 years away, due to paucity of commercial R & D effort at present. Novel formulations of BT toxins are expected to expand their use.

Use of live insects to control pests will grow rapidly from its current tiny base. They will find a good outlet in agricultural greenhouses in the US, as they have already in Europe and Canada. Fungal and bacterial inoculants to promote plant growth and prevent pathogens should be commercialised over the next five to 10 years, as ways of applying them to seeds are developed. A similar schedule for market entry is expected of viral insecticide formulations.

Use of microbes as herbicides looks less promising. Recent developments of safer chemical herbicides, prospects of genetic engineering and concerns about microbe specificity should keep biological herbicide use at insignificant levels for the foreseeable future.

Despite their modest success to date, says F & S, biopesticides are highly appealing, Chemical products require $40m to develop and 5-7 years to register; biopesticides need only $2m and 1-2 years for clearance. Safety of biopesticides is generally much easier to provide than safety of comparable chemical pesticides. Other factors in their favour are that danger to farm workers is lessened and public concern over food residues reduced. Organic

MCA
MONOCHLORO ACETIC ACID
EDTA
ETHYLENE DIAMINE TETRA ACETIC ACID
NTA
NITRILO TRI ACETIC ACID
DTPA
DIETHYLENE TRIAMINE PENTA ACETIC ACID
CHELATING AGENTS AND THEIR SALTS
And Special Auxiliaries and Chemicals.

MFRS : SHIVCHEM INDUSTRIES
C-1-B, SHED NO. 1307/10, PHASE IV, G.I.D.C. ESTATE,
NARODA, AHMEDABAD-382330. TEL. NO. 812447
OFFICE : NIRAV COMPLEX, 1ST FLOOR, NR. NAVRANG SCHOOL,
AHMEDABAD-380014. T. NO. 495501, 491488

AGENT FOR MAHARASHTRA STATE
SHREE AMRUTA ORGANICS PVT. LTD.
813, RAHEJA CENTRE, 214, NARIMAN POINT,
BOMBAY-400 021. PHONE : 240415, 243979, 2873680

farming will provide a boost to biopesticide use. The market for these products is currently dominated by Abbott Laboratories and Sandoz Crop. Protection. Start-up biotech firms such as Ecogen and Mycogen have recently entered the market and are taking a growing share of the BT toxin market.

## BST PROBLEMS

Prospectus for bovine somatotropin, BST, the genetically engineered cattle hormone, are looking bleaker. German unification will have a negative impact on BST sales, and a row has broken out in the US over its use.

BST's use is currently permitted in East Germany although banned in West Germany. East German farmers have been told that will have to abide by West German rules by 1991.

Meanwhile, the US National Dairy Board, an organisation funded by farmers, is under attack for planning a $1.1m programme to educate the population about BST. Dairy farmers are angy that the board is spending money 'to defend a controversial hormone that the Food & Drug Administration has not yet approved for commercial use.'

## COMPOSITES CENTRE LAUNCHED

Montedison is to establish a world-class centre for development of composite materials and their industrial applications at Tencara shipyard at Porto Marghera, near Venice, Italy. The location has been chosen because of the company's composites work there on the development of a hull for the Moro di Veneziaa america's cup boat. Montedison claims the hull project is technologically comparable to the most recent achievements in Formula 1 car racing and the aerospace sector. Other Montedison companies involved include Structural Polymer systems, Monfrini, Montefibre, Texindustri SIR, for development of new resins an catalystic systems for prepegs, an Himont, which is working on special ised applications for ultra-high molecular weight polyethylene.

Announcing the move in the Tencar shipyard, Montedison also said it wa forming a new subsidiary, Orion, ' specialise in the developement c simple, environmentally compatible high technology processes'. The company, based in Venice, will brin together scientists and academics Syremont, the Montedison compan specialising in chemical applications i art restoration, will also be strengthene and moved to Venice.

Italo Trapasso, vice chairman c Montedison, said the company is spending Lira 300bn/year ($252m) on materials research, and that L850bn had bee spent on fixed assets in 1989, excludin acquisitions. He indicated that the grou expects to achieve sales revenue in th materials sector of L10.5 trillion by '9 and L13 trillion by 1995. This year sales are expected to be L8 trillion.

## OUTOKUMPU WINS US WAST PROJECT

Outokumpu Ecoenergy is to supp a turnkey hazardous waste manageme facility to CSI Corp, a private compa created to handle the state of Mississi pi's waste disposal needs. The plant believed to be the first in North Ame ica to include both rotary kiln a fluidised-bed technologies.

The CSI operation, on an 80-acre si in Issaquena County, Mississippi, w draw many of its features from t Ekokem facility in Finland, built Outokumpu. The rotary kiln is design to handle a full range of waste typ including liquid hazardous waste a drums filled with solid hazardous was It will be capable of processing conta inated soil removed from the site chemical spills.

WE CAN OFFER EX-STOCK

DIPHEN HYDRAMINE HYDROCHLORIDE I.P.
SULPHACETAMIDE SODIUM I.P.
SULPHACETAMIDE SODIUM DRC QUALITY
SULPHACETAMIDE PLAIN
SULPHANILAMIDE I.P. & TECH.
LIGNOCAINE HCl I.P.
LIDOCAINE BASE I.P.
ZINC SULPHATE MONOHYDRATE (PHARMA GRADE)
DOSS (DIOCTYL SODIUM SULPHOSUCCINATE)
DRIED FERROUS SULPHATE I.P.
FERROUS SULPHATE CRYSTALS
AMMONIUM CHLORIDE I.P.
SODIUM CHLORIDE I.P. &
POTASSIUM CHLORIDE I.P.
PETROLEUM JELLY I.P. ABSOLUTELY COLOURLESS & ODOURLESS

Please Contact:

M/s. PUNEET INTERNATIONAL

Hanuman Building, 2nd Floor, Picket Road, Bombay 400 002.
Tel.: 315057 Resl.: 6264613, 6124515

Eves Advtg

# News about New Projects

## SOL STUDIES PS PLANT IN
## /ITH IDEMITSU

psol Quimica says it is consider-
ntering the European polystyrene
et in a joint venture with Japan's
ng producers Idemitsu Petrochem-
and Sumitomo Corp. Talks on a
0 tonne/year joint venture plant in
are at an advanced stage.

psol has confirmed the three com-
s are jointly carrying out final fea-
ty studies. The main sites under
deration are Monzon in Huesca
nce, where Repsol has a petro-
icals subsidiary, and Tarragona on
lediterranean coast. Both plants are
to local polystyrene markets, a
ol spokesman said.

emitsu would supply technology
he plant, while Repsol would
ly the styrene feedstock from its
ing 110 000 tonne/year plant at
ollano. Startup is envisaged by
1992. The plant would be built and
ged by a new joint venture. Share-
ings have still to be finalised,
gh Repsol Quimica is expected to
a majority stake.

eanwhile Idemitsu plans to invest
.7 bn ($1bn) over the next 15 years
integrated petrochemical complex
asir Gudang, Johor, Malaysia.

ccording to local reports, the com-
has acquired a 111-hectare site, at
st of M$50m, on which it will build
to produce 200 000 tonne/year sty-
monomer and 60,000 tonne/year
ndable polystyrene (EPS). The
65m plant, which is expected to
e onstream early next year, repre-
s the first of a five-stage develop-
t of complex.

lanaging director Hiroshi Ichino
the company is planning other pet-
emical projects in the region. He
ribed the venture as a marriage between Japanese technology and Malaysian business skill.

Upon completion, Idemitsu claims it will be the largest producer of styrene monomer and EPS in the region. Both Shell and BASF have also recently announced plans to build EPS plants at Pasir Gudang. The Shell plant, due onstream next year, will have a capacity of 30,000 tonne/year and BASF's set for startup in 1992, will produce 40,000 tonne/year.

## MONTEFLUOS DETAILS HFC 134a PLANS

Montefluos, the fluorochemicals arm of the Ferruzzi/Montedison group, has revealed, that it is planning commercial scale production of HFC 134a and HCFC 123 by early 1994. The company is currently building a pilot plant for the two leading CFC alternatives at its Porto Marghera site, near Venice.

The pilot plant, which will be capable of producing semi-commercial quantities of around 100 tonne/month, is due onstream early next year. The commercial scale plant, which is still subject to board approval, would manufacture both HFC 134a and HCFC 123 using Montefluos' own techology.

Plant capacity has yet to be decided, depending on the market demand for the alternatives, according to Gianfranco Corazza, Montefluos' business manager for CFCs and alternatives. Work is continuing to make HCFC 124 and HFC 125 by a similar process route. 'The technology is so flexible: one plant will be able to produce all four products', Corazz said. But he conceded it was too early to say how competitive the approach would be compared with dedicated alternatives plants planned by other major CFC producers. The plants are part of a total £100bn ($84m) investment in CFC alternatives that Montefluos plans to make over the next four years. The company has designated Porto Marghera, where HF feedstock is readily available, as its alternative production site. A fully halogenated CFC plant at the site was closed down last year in a move to cut the company's CFC production by 50%. Montefluos' only other CFC plant, at Spinetta Marengo, near Milan, continues to operate to meet Italian demand.

Corazza also revealed Montefluos hoped to develop technology to produce HCFC 141b, widely regarded as a challenge to HCFC 123 in foam blowing applications, through a former Pennwalt facility at Thorofare, New Jersey. The Ferruzzi/Montedison group is in the process of acquiring the Thorofare facility, which includes a production unit for the related HCFC 142b compound. The acquisition is part of an asset swap deal with Atochem North America, relating to Atochem's acquisition of Pennwalt earlier this year. Incorporation of the US facility should be complete by the end of this year.

## FRANCE OKAYS CITRIC ACID UNIT

A dispute has broken out in France between the 'greens' and president Francois Mitterand over the authorisation granted by Strabourg to the Austrian company Jungbunzlauer for construction of citric acid unit in the Rhine forest at Marckolsheim. Asked to intervene to halt the project, Mitterand ruled it was not environmentally harmful to the forest. Days earlier, he had declared himself a defender of France's forests.

The final compromise involves authorisation to use 80 hectares of the forest for the citric acid unit which the Austrian company wishes to build to produce food additives and preserving agents from wheat and corn.

In exchange, some 152 hectares of the same forest, previously set aside for industrial development, will now remain intact.

A lead streate unit, proposed earlier by Austria's Chemical Werke CWM, fell through because of environmental opposion.

## ZIMMER WINS THAI POLYESTER CONTRACT

Zimmer is to build a 100 tonne/day polyester melt plant for textile manufacturer Sun Flag (Thailand).

The DM120m ($73.6m) plant will be built at Ayuthaya, 70km north of Bangkok.

The polyester melt will be used to produce 70 tonne/day of chips, 20 tonne/day of partially oriented yarn and 10 tonne/day of fully drawn yarn.

The plant, based on Zimmer's continuous polycondensation process, will use terephathalic acid and ethylene glycol as feedstock. Completion of the plant is set for 1992.

## BASF TO DEVELOP GRASSROOTS SITE ON MEXICAN GULF COAST

BASF's new chairman Jurgen Strube has revealed that the company plans to develop a recently acquired grassroots site at Altamira, Mexico, into a large-scale complex to serve the growing local and neighbouring US markets.

Strube says the company does not plan a second Ludwigshafen-or-Antwerp-scale complex, but that the site could grow to the size of its Tarragona complex in Spain if the trade between the US and Mexico continues to develop as in recent years.

The company acquired 27 hectares at Altamira on the Gulf coast, some 350km northeast of Mexico City last year.

It is now negotiating to acquire a further 26 hectares at the same site and retains an option to buy a further 49 hectares at a later date.

The company says no decision has been taken on individual plants, but that it is starting work to develop the necessary infrastructure.

BASF Mexicana produces polyurethane systems and pigments; BASF Vitaminas, vitamins; and Fritzsche Dodge Olcott, aromatics.

Inmont produces detergents and Pinturas Aurolen, colourants, while polyols and pharmaceuticals are supplied by Polioles and Quimica Knoll, respectively.

## EASTMAN/RP SIGN ACETATE JV

Eastman Chemical, a division of Eastman Kodak, and Rhone-Poulenc Chimie have signed a letter of intent for joint construction of a plant to produce 60,000 tonne/year fibre-grade cellulose acetate.

A preliminary joint feasibility study will determine the production site, either in the US or in Europe.

The new plant, set for completion in 1993, will combine the technologies of both companies which, it is claimed, will ensure significant cost advantages over other commercial processes.

Total investment should amount to around FF1bn ($183m). Each party is expected to take half the plant's output.

Cellulose acetate is the raw material for cigarette filters for which there is a growing market related to the trend to reduce the tar content of cigarettes.

Eastman Kodak is the second largest world producer of cellulose acetate behind Hoechst, with production of some 200,000 tonne/year.

Rhone-Poulenc produces around 80,000 tonne/year and is the fourth world producer after Japan's Daicel.

## SANDOZ WINS IRISH DRUGS UNIT GO-AHEAD

The Irish national planning board h confirmed permission granted to Sand by Cork county council to construct pharmaceutical plant at Ringaskidd County Cork.

Attached to the permission are som 40 conditions, which the Swiss com pany says it will study in detail befo commenting further. At first sight, t conditions do not seem to pose insupe able problems', it says.

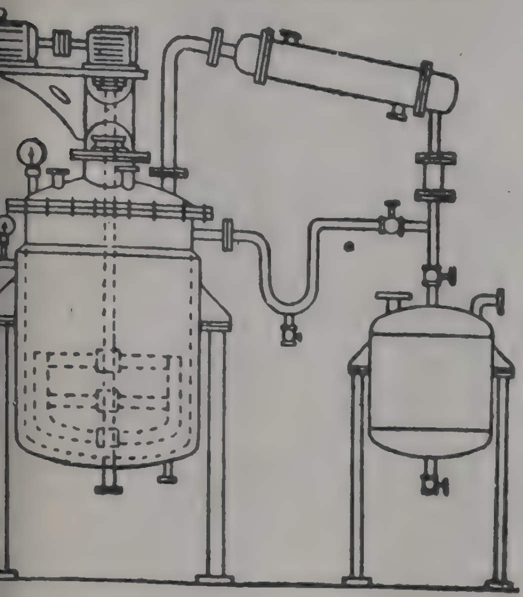
Sandoz envisages a construction a commissioning programme of up three years for the Punt 170m ($279 plant which will produce a range active ingredients for Sandoz produc

Earlier, the company had threaten to cancel the plant and pull out of E completely unless the final go-ahe was received by September.

## MITSUBISHI KASEI IN INDON SIAN PTA JV

Japan's Mitsubishi Kasei is set u pure terephthalic acid (PTA) plant Indonesia in a joint venture which lo concern Bakrie & Brothers. PT Bak Kasei, to be formed this October, w be 80% owned by Mitsubishi Kasei a 20% by Bakrie & Brothers. It w invest Yen30bn ($202m) in a n 250,000 tonne/year plant to be buil Serang, west Jawa.

The plant is set to come onstream mid-1993. The venture is being est lished to meet local demand, curren estimated at 220,000 tonne/year expected to grow at 7-8% year. Mits ishi Kasei is Indonesia's leading s plier of PTA, exporting 50, tonne/year to polyester manufacturer the country. The company curren manufactures 600,000 tonne/year Japan and 200,000 tonne/year in So Korea.



For your requirement of

* REACTION VESSEL
* CONDENSORS
* STORAGE TANKS
* PRESSURE VESSELS
* COLUMNS/RECEIVERS
* HEATING UNIT

We design and fabricate the above and any type of equipments in S.S./M.S./M.S. Rubberlined/Lead Bonded. We also undertake the erection and commissioning of the complete plant.

**KRISHNA ENGINEERING CORPORATION**

Office: 49, Kailash Apartment No. 3, Rambaug, S.V. Road,
Behind Himalaya School, Borivli (West), Bombay 400 092.

Factory: Bhayandar (East), District Thane.

Phones: O/R. 6060632 Factory: 6982830

AVAILABLE
INTERNATIONAL STANDARD QUALITY

**METHYL DICHLORO ACETATE**

At Rs. 83/- (Inclusive of Everything)
Packed in 250 Kgs. HM HDPE Barrels.

**NIFEDIPINE U.S.P. XXII**

At Rs. 1,100/- (Inclusive of Everything)

Inquiries for export are also welcome
Please Contact Manufacturers:

**JASMINE CHEMICAL INDUSTRIES**

54/C, Mittal Tower, Nariman Point, Bombay 400 021.
Tel.: 2872794/95 Tlx.: 011-85360 ORKA IN Fax: 91-22-2042737

QUALITATIVELY & QUANTITATIVELY THE BEST

☐ **GUM ACCACIA**
(Powder & Crystal)

☐ **GUAR GUM**
(Pharma & Other Grades)

☐ **GUM TRAGACANTH**
(Imported & Indian)

☐ **GUM ARABIC**
(All Grades)

We can supply as per New I.P. 1985 with Microbiological Test

FOR YOUR REQUIREMENTS CONTACT:

**ASIAN ENTERPRISES**

New Bhagwan Bhuvan, Ground Floor, 196/198, Samuel Street, Bombay 400 009.
TEL. OFF.: 8720565
TELEX: 11-5781-VSON
RESI: MR. SHAH - 383365
RESI: MR. MODI - 4374289

We are keenly interested in taking up Agency for Pharmaceutical Raw Materials and Fine Chemicals

For Your Requirements Of:

**META DI NITRO BENZENE**
**META NITRO ANILINE**
**META AMINO ACETANILIDE**
**4 NITRO 2 AMINO PHENOL**

CONTACT MANUFACTURERS

**Mangalam Organics Pvt. Ltd.**

Regd. Office 292 Princess Street 2nd Floor Near Flyover Bombay-400 002
Gram: DHOOTUDYOG • Phones: 317969 • 317411 • 317489 Telex: 011-4643 MRPL IN

Factory Plot No. 1203 G.I.D.C. VAPI Dist. Valsad Gujarat Phone 930 Telex 183 256 SMPL IN

ZENITH CARBOYS OFFER

**Round H.D.P.E. Barrels specially for filling Powder, Pastes & Pickles in capacities of 20 ltrs., 25 ltrs., 30 ltrs. 50 ltrs., 80 ltrs., & 100 ltrs.**

Contact Manufacturers

**ZENITH CARBOYS**

32, Unique Industrial Estate, Opp. Jawahar Talkies, Mulund (W), Bombay 400 080.
**Tel.: 5600309 / 5618526 / 5605599**

# MARKET INFORMATION

## Toluene, Resorcinol Shoot Up

We cannot guarantee the accuracy of the prices published in CHEMICAL WEEKLY as they are based only on the enquiries made by our correspondent — and, as such they are not FIRM PRICES as between a buyer and seller. The prices are published only with a view to giving some ideas of the market conditions.

The prices are inclusive of Excise and Maharashtra Sales Tax.

On account of the Gulf prices of troleum bases, chemicals were steady. Toluene shot up to Rs. 15, rylamide moved up further with ortage in supplies. Arrival of ported material steadied prices of ohsenol GH-17 to Rs. 135. Seasonal demand of hyflosupercell pushed its price up by Rs. 6 to Rs. 34. In the dye intermediates section shortage of material and raise in price by manufacturers pushed up price of resorcinol by Rs. 25 to Rs. 255.

**(Prices as on August 28, 1990)**

| DUSTRIAL CHEMICALS | Per Kg. |
|---|---|
| nmonium sulphate | 2.50 |
| nmonium phosphate (Mono) | 14.50 |
| nmonium phosphate (Di) | 14.50 |
| nmonium carbonate (Di) | 17.00 |
| nmonium bicarbonate | 6.00 |
| nmonium chloride | 3.25 |
| nmonium nitrate | 6.00 |
| senic white powder | 22+ST |
| crylamide (Resale) | 85.00 |
| arium carbonate | 20.00 |
| eaching powder (33% Cl) | 5.00 |

| | |
|---|---|
| Borax (Granular) | 16.00 |
| Borax (Powder) | 22.00 |
| Boric acid (Tech) | 32.00 |
| Bisphenol-A | 75.00 |
| Butyl carbitol | 106.00 |
| Caustic soda (Flakes) | 11.50 |
| Caustic soda (Solid) | 12.00 |
| Caustic soda (Lye) | 10.00 |
| Calcium chloride 70% (Solid) | 3.25 |
| Calcium chloride 75-80%(fused) | 3.50 |
| Calcium chloride 36% (Anhydrous) | 5.00 |
| Calcium carbonate (precipitated) | 6.00 |
| Calcium carbonate (Activated) | 5.75 |

| | |
|---|---|
| Cobalt oxide | 550.00 |
| Cresylic acid | 62.00 |
| Camphor (Indian) | 105.00 |
| Cream of Tartar (Tech.) China | 70.00 |
| Citric acid (Belgium) (Resale) | 47.00 |
| Citric acid (Indian) (Resale) | 41.00 |
| Copper sulphate | 24.00 |
| Chromic acid | 63.00 |
| Ethylene urea | 58.00 |
| Ferric chloride (Lumps) | 9.00 |
| Ferric chloride (Anhydrous) | 20.00 |
| Glue flakes | 15.00 |
| Glue sheets | 6.75 |
| Gohsenol GH-17 | 135.00 |
| Hydro | 39+ST |

Paints, Pharmaceuticals, Pesticides & Chemicals
Manufacturers for your Requirements of

NOCIL PRODUCTS

ACETONE
DIACETONE
ISOPROPANOL
N-BUTANOL
M.I.B.K.
IPA-CBM
ISOBUTANOL
E.D.C.
2-ETHYL HEXANOL
P.E.G. 200/300/400/600/1500
M.E.G.
D.E.G.

Please Contact: Authorised Distributors for Gujarat State.

SHREE AMBICA TRADING CORPORATION

**Bombay Office:**
813, Raheja Centre, 214, Nariman Point,
BOMBAY - 400 021
**Phones:** 240415/243979/2873680
**Telex:** 011-6053 SATC-IN

**Ahmedabad Office:**
4A-B, Trade Centre, Near Stadium House,
Ahmedabad-380 014
**Phone:** 462332/440084

| | |
|---|---|
| Hyflosupercell | 34.00 |
| Hexamine (Resale) | 34.00 |
| Industrial Wax | 25.00 |
| Litharge | 40.00 |
| Lead Acetate (Tech.) | 39.00 |
| Lithopone | 32.00 |
| Magnesium chloride (Crystal) | 2.00 |
| Menthol crystal (Flakes) | 355+Ex+ST |
| Menthol bold | 425+Ex+ST |
| Menthol crystal cold | 395+Ex+ST |
| Magnesium carbonate (Japan) | 30.00 |
| Magnesium carbonate (Indian) | 26.00 |
| Maleic Anhydride (Resale) | 39.00 |
| Mercury (34.5 Kgs) | 11,500.00 |
| Nickel chloride | 110.00 |
| Oxalic acid (Resale) | 15.00 |
| Peppermint oil (Rectified) | 188+Ex+ST |
| Potassium carbonate (Indian) | 28.00 |
| Potassium carbonate (Imported) | 32.00 |
| Potassium bichromate | 38.00 |
| Potassium phosphate (Mono) | 34.00 |
| Potassium phosphate (Di) | 25.00 |
| Polyvinyl alcohol (No 117) | 93.00 |
| Polyvinyl alcohol (No 173) | 140.00 |
| Polyvinyl alcohol (No 208) | 170.00 |
| Paraformaldehyde (Resale) | 20.50 |
| Phthalic anhydride (Resale) | 34.00 |
| Pentaerythritol (Resale) | 49.00 |
| Paraffin wax | 22+ST |
| Rangolite (German) | 96+ST |
| Rangolite (Czech.) | 72.00 |
| Rangolite (China) | 53.00 |
| Sodium sulphate (Fine) | 3.75 |
| Sodium sulphate (Coarse) | 3.50 |
| Sodium sulphide 50-52% (Flakes) | 11.50+ST |
| Sodium sulphide 58-60% (Flakes) (TCL) | 25.00 |
| Sodium sulphide pure (Flakes) | 12.25 |
| Sodium nitrite (Resale) per 50 kg. | 1,300.00 |
| Sodium chlorite 80% (Spain) | 100+ST |
| Soda Ash (Tata) | 5.25 |
| Soda Ash (Birla) | 5.25 |
| Soda Ash (Imp.) | 5.00 |
| Sodium bicarbonate | 7.00 |
| Sodium bisulphite | 8.00 |
| Sodium silicate | 5.50 |
| Sodium acetate | 7.20 |
| Sodium alginate | 450.00 |
| Titanium Dioxide (Anatase) | 65.00 |
| Titanium Dioxide (Rutile – $RCR_2$) | 88+ST |
| Tartaric acid | 190.00 |
| Trisodium phosphate | 12.00 |
| Thiourea | 78.00 |
| Urea (Tech.) | 3.00 |
| Vacuum salt | 1.00 |
| Zinc Dust | 52.00 |
| Zinc Oxide | 58.00 |
| Zinc chloride powder (Tech.) | 20.50 |
| Zinc sulphate | 7.00 |

| SOLVENTS | Per Kg. |
|---|---|
| Acetic Acid Glacial (Resale) | 13.00 |
| Acetic Anhydride (Resale) | 33.50 |
| Acetone (Resale) | 19.00 |
| Adipic Acid | 90.00 |
| Aceto Acetanilide | 55.00 |
| Aniline Oil (HOC) | 46.00 |
| Benzoate Plasticiser | 62.00 |
| Butyl acrylate | 75.00 |
| Butyl stearate | 38.00 |
| Butanol | 32.00 |
| Benzyl Alcohol | 60 |
| Benzyl Chloride | 34 |
| Benzo trichloride | 16 |
| Benzoyl chloride | 22 |
| Bromine Liquid | 68 |
| Chloroform | 30 |
| Carbon Tetrachloride | 20 |
| Cellosolve | 58 |
| Cyclohexanone | 64 |
| Cyclohexanol | 58+ |
| Diacetone (Resale) | 26 |
| Diethyl Oxalate | 34 |
| Diethyl glycol (DEG) | 30+ |
| Dioctyl Phthalate | 45 |
| Diallyl Phthalate | 42 |
| Dimethyl Phthalate | 28 |
| Dioctyl Adipate | 52 |
| Dibutyl Adipate | 42 |
| Dipentene | 15 |
| Dimethylamine 40% | 30 |
| Dimethylamine 50% | 35 |
| Ethyl Acetate | 16 |
| Ethyl Acrylate | 66 |
| Ethylene Dichloride | 18 |
| Ethylene Glycol | 32 |
| Formic Acid (Imp.) | 24 |
| Formaldehyde (Resale) | 6 |
| Glycerine (CP) | 48 |
| Glycerine (IW) | 55 |
| Hydrogen Peroxide 50% (Resale) | 35 |
| Isopropyl Alcohol | 26 |
| Isobutyl Alcohol (Resale) | 35 |
| Monoethanolamine (Resale) | 95 |
| Melamine | 60 |
| Methyl Ethyl Ketone | 43 |
| Methyl Isobutyl Ketone | 34 |
| Methyl Acrylate | 60 |
| Methylene Dichloride (Resale) | 10 |

FOR YOUR REQUIREMENTS OF:

**Di Octyl Phthalate (D.O.P.)**
**Di Butyl Phthalate (D.B.P.)**
**Di Butyl Maleate (D.B.M.)**
**Di Octyl Maleate (D.O.M.)**
**Di Octyl Adipate (D.O.A.)**
**Butyl Stearate**

PLEASE CONTACT MANUFACTURERS:

**Vikram Plasticizer**

1204, Dalamal Tower, Plot No. 211,
Nariman Point, Bombay 400 021.
Phones: 230006, 231192, 233554, 233562

S U L P H U R

SULPHUR POWDER RUBBER GRADE
99.5 to 100% pure, free from A.S.T.
THREE WHEELS BRAND

SULPHUR POWDER EXPLOSIVE GRADE
99.5% pure, free from A.S.T.

AGRICULTURE DUSTING POWDER
SULPHUR DUST 85% DP
KISAN BRAND

UBLE REFINED ROLL SULPHUR & AMLASAR (CRYSTAL SULPHUR)

Manufacturers

M/s. V.A. CHEMICAL AND SULPHUR INDUSTRIES
6, Fancy Chambers, Plot No. 64, Surat Street, Bombay 400 009
Nos: 346945/27244/320370 Telex: 011-76463 DVS IN Gram: SULFREFINE

GOOD NEWS

For Small Buyers Also
Buy Minimum 10 Drums of

BUTYL ACETATE

At Rs.31/- (Inclusive of Everything)
Packed in 185 Kgs HM HDPE Barrels and avail free gifts

Contact Manufacturers

IREE SAI RATNA RASAYAN UDYOG PVT. LTD.

54/C, Mittal Tower, Nariman Point, Bombay 400 021
Tel.: 2872794/95 Tlx.: 011-85360 ORKA IN Fax: 91-22-2042737

FOR YOUR REQUIREMENTS FROM READY STOCK

CETONE
ACETONE
BUTANOL
OBUTANOL
E.G. / E.D.C.
NZENE / M.E.G.
E.K. / M.I.B.K.
OLUENE
DIUM FORMATE
A-CBM

XYLENE
(ORTHO/PARA/MIX)
SOLVENTS C-IX (CRUDE)
NITROBENZENE
FORMALDEHYDE (37% HOC)
PHENOL (LIQUID/CRYSTAL)
ETHYL ACETATE
BUTYL ACETATE
ACRYLONITRILE
(ORIGINAL/REPACK)

N-HEXANE FOOD GRADE
ANILINE OIL
FORMIC ACID (IMP)
PROPYLENE GLYCOL
STYRENE MONOMER
VINYL ACETATE
MONOMER
and all kinds of
SOLVENTS &
CHEMICALS

Please Contact:

Hiren Chem Corporation
306, Adamji Building, 3rd Floor, 413-Narshi Natha Street, Bombay 400 009.
Tel: 343426-333692-338139. (R) 5604922.
Branch Office: SHINE PHARMA CHEM
B.G. Tower, 4th Floor, Opp. Delhi Darwaza, Shahi Baug Road, Ahmedabad 380 004. Tel: 20959-24186. (R) 67003-68229

| | |
|---|---|
| Carbitol | 72+ST |
| Meta Cresol | 45.00 |
| Nitrobenzene | 19.00 |
| Nitric Acid (Conc.) (RCF) | 2.50 |
| Ortho Cresol | 30+ST |
| Phenol (Resale) | 40.00 |
| Propylene Glycol | 52.00 |
| Polyethylene Glycol (No.200) | 50.00 |
| Polyethylene Glycol (No.400) | 70.00 |
| Polyethylene Glycol (No.500) | 52.00 |
| Polyethylene Glycol (No.1600) | 54.00 |
| Polyethylene Glycol (No.4000) | 80.00 |
| Polyethylene Glycol (No.6000) | 85.00 |
| Para Cresol | 120.00 |
| Styrene Monomer | 42.00 |
| Sorbitol | 14.00 |
| Sulphuric Acid | 2.80 |
| Trichloroethylene | 26.00 |
| Triethanolamine (Resale) | 85.00 |
| Turpentine Oil (Germany) | 8.00 |
| Turkey Red Oil (50%) | 20.00 |
| Vinyl Acetate Monomer | 52.00 |

| SOLVENTS | Per Litre |
|---|---|
| Benzene | 12.00 |
| N-Heptane | 10.50 |
| N-Hexane | 11.00 |
| Methanol | 8.50 |
| Solvent Naphtha Heavy | 10.50 |
| Solvent Naphtha Light | 8.50 |
| Toluene | 15.00 |
| Xylene | 22.00 |

## DYES INTERMEDIATES (PRICES ARE WITHOUT TAX AND EXCISE)

| | |
|---|---|
| Alphanaphthylamine | 65.00 |
| Alpha Naphthol (Imp.) | 155.00 |
| Aceto Acetic Ester (Methyl) | 65.00 |
| Ammonium Molybdate | 210.00 |
| Anthraquinone | 120.00 |
| Anthranilic Acid | 76.00 |
| 2-Amino 4-Nitrophenol | 140.00 |
| Blue B. Base (Local) | 305.00 |
| Beta Naphthol (Atul) | 65.00 |
| Benzidine Dihydrochloride (BDH) | 76.00 |
| Bromamine Acid | 470.00 |
| BON Acid (Incl. of excise) | 140.00 |
| Chicago Acid (Atul) | 350.00 |
| Coach Acid | 52.00 |
| C. Acid (Imp.) | 210.00 |
| Cyanuric Chloride | 160.00 |
| 2,4- DNCB | 27.00 |
| Dihydrothio PTOS (Imp.) | 1,500.00 |
| Dimethyl Aniline | 64.00 |
| Diethyl Aniline | 140.00 |
| Diamino stilbene disulphonic acid | 160.00 |
| 3,3-DCB (Imp.) | 200.00 |
| Gamma Acid (Atul) | 200.00 |
| H. Acid (Atul) | 95.00 |
| G. Salt | 70.00 |
| Isophthalic Acid | 50.00 |
| J. Acid | 335.00 |
| J. Acid Urea | 460.00 |
| K. Acid | 110.00 |
| MPDS (German) | 185.00 |
| Meta Ureido Aniline | |
| MPD (Local) | 160.00 |
| MPD (Japan) | 180.00 |
| Naphthenic Acid | 46.00 |
| N-Methyl J. Acid | 525.00 |
| N-Methyl Aniline | 120.00 |
| Naphthalene (Refined) | 24.00 |
| Ortho Anisidine (OA) (Imp.) | 112.00 |
| Ortho Dichloro Benzene (ODCB) | 18.00 |
| OT Base | 120.00 |
| Para Dichloro Benzene (PDCB) | 28.00 |
| Para Anisidine (PA local) | 125.00 |
| PNA | 88.00 |
| Para Cresidine (Imp.) | 370.00 |
| Para Amino Azo Benzene (India) | 135.00 |
| PNCB (HOC) | 54.00 |
| Para Amino Acetanilide | 200.00 |
| 1-Phenyl 3-Methyl 5-Pyrazolone | 135.00 |
| Phenyl J. Acid | 360.00 |
| Para Amino Benzoic Acid | 135.00 |
| PT Base | 128.00 |
| Rhoduline Acid | 520.00 |
| Resist Salt 80% | 28.00 |
| Resorcinol | 255.00 |
| Sodium Naphthionate | 65.00 |
| 5-Sulpho-Anthranilic Acid | 78.00 |
| Sulphanilic Acid | 30.00 |
| Sulpho Tobias Acid | 140.0 |
| Trichloro Benzene (TCB) | 22.00 |
| Tobias Acid (Imp.) | 132.0 |
| Metanilic Acid | 41.0 |
| MTD | 128.0 |

# We Manufacture Chemicals For Industrial Use

- Acetic Acid
- Acetic Anhydride
- Acetaldehyde
- Industrial Alcohol
- Monochloro Acetic Acid
- Ethyl Acetate
- Butyl Acetate
- EDTA
- NTA
- Carboxy Methyl Cellulose

## ASHOK ORGANIC INDUSTRIES LTD.

406,Sharda Chambers, 33.Sir Vithaldas Thackersey Marg (New Marine Lines),Bombay-400 20
Phone : 252236 : 252256 : 317511 Gram : 'ASHOKBROS' Telex : 11-3853 AOIL IN

Also Please Contact:

**Baroda :** Phones : 324519-325769
Telex : 0175-597 AOIL IN
**Ahmedabad :** Phone : 78009
**Ankleshwar :** Phone : 2461-2462
Telex : 0189-238 AOIL IN

**New Delhi :** Phones : 5710733-5711057
**Calcutta :** Phones : 282474-282475
Telex : 021-7917 SBIL IN
**Madras :** Phone : 582046
Telex : 041-7527 SBIL IN

**Bangalore :** Phones: 570746-570760
Telex : 0845-8275 SBIL
**Hyderabad :** Phones : 73737-831049
**Poona :** Phone: 50797

Plants at : Nandesari - Baroda; GIDC Ankleshwar; Boridra - Bharuch

**IN GOD WE TRUST**

For Excellent Quality & Regular Guaranteed Supplies at Competitive Rates:

CALCIUM STEARATE
MAGNESIUM STEARATE BP 80
ZINC STEARATE
ALUMINIUM STEARATE

COPPER SULPHATE IP
DRIED ALUMINIUM HYDROXIDE IP
MAGNESIUM HYDROXIDE POWDER IP
ZINC CARBONATE

AND OTHER LABORATORY CHEMICALS

Contact Manufacturers & Exporters:

AI

**ARUN INDUSTRIES**

303-A, Vrindavan, Ramachandra Lane, Malad (West), Bombay-400 064.
Phone: Office: 6820559/6820422 Telex: 011-78081 ARUN IN
Gram: "DEVOTION"

WE ARE REGISTERED WITH D.G.S. & D

HC

**H-ACID**

OF INTERNATIONAL STANDARD
FROM

**SHREE HARI CHEMICALS (INDIA) PVT. LTD.**

CATERING TO THE NEEDS OF DOMESTIC & EXPORT MARKETS EFFICIENTLY

**Bombay Office:** Amrit Niwas, 3rd Floor, 159/2, Cavel Cross Lane No. 6,
Kalbadevi, Bombay 400 002.
**Phones:** 292081/258697 **Telex:** 011-5394 ANUJ IN (SHC)
**Works:** A/8, M.I.D.C., Mahad, Distt. Raigad.
**Phone:** 2711/2713

*ETHYL CELLOSOLVE * ETHYL CARBITOL*
*TRICRESYL PHOSPHATE * CELLOSOLVE ACETATE*
*BENZYL ACETATE FFC * BENZYL ALCOHOL FFC*
*SODIUM BI-SULPHATE * POTASSIUM BI-SULPHATE*
*METHYL CELLOSOLVE ACETATE*
*TRI PHENYL PHOSPHATE*

For Your Requirement Please Contact:

tl **trade link**

5/363, Mangaldas Building, Trikamji Ghia Marg, 2nd Floor, BOMBAY - 400 002.
Phone: 297718/259487; Resi: 473310 Gram: 'POLOSIGHT' Telex: 4256 PTK IN

# Bombay Dyes Market

(Prices as on August 28, 1990)

| ACID COLOURS | Per Kg. |
|---|---|
| Acid Violet 4BS | *190.00 |
| Acid Maroon V | 110.00 |
| Acid Orange II | 112.55 |
| Acid Orange IIY | 93.85 |
| Acid Red A | 137.00 |
| Acid Scarlet 3R | 128.35 |
| Acid Red 3BN | *195.00 |
| Acid Red R2R | 132.00 |
| Acid Red RS | 88.00 |
| Acid Patent Blue AS | *280.00 |
| Acid Green V | *375.00 |
| Acid Coomasi Blue | 200.00 |
| Acid Yellow 5GN | 65.00 |
| Acid Red PG | 85.00 |
| Acid Red GRS | 78.00 |
| Acid Black 10 BX | 157.15 |
| Acid Black BX | 126.95 |
| Acid Black Wax | 135.50 |
| Crosein Scarlet MOO | 200.30 |
| Procinil Yellow GS (ICI, UK) | 265.00 |
| Procinil Red GS (ICI, UK) | 530.00 |
| Procinil Blue RS (ICI, UK) | 315.00 |
| Procinil Scarlet G (ICI, UK) | 600.00 |
| Procinil Orange G (ICI, UK) | 250.00 |
| Procinil Rubine (ICI, UK) | 550.00 |

- To get resale price add 6% tax

| DIRECT COLOURS | Per Kg. |
|---|---|
| Yellow 3GX | 114.00 |
| Gun Yellow RCH | 175.85 |
| Fast Yellow GCH | 171.50 |
| Yellow CFG Hly. Conc. | 721.00 |
| Fast Yellow GS | 126.96 |
| Fast Yellow CHRS | 116.85 |
| Viscose Orange A | 210.35 |
| Fast Orange GR | 171.50 |
| Red | 122.65 |
| Dark Tan | 98.15 |
| Red IIR | 98.15 |
| Red 4B | 217.55 |
| Bordeaux BW | 170.10 |
| Fast Scarlet 4BS | 223.50 |
| Red 12B | 220.45 |
| Bordeaux Hly. Conc. | 249.20 |
| Cotton Red N | 117.05 |
| Brill. Fast Helio B | 362.85 |
| Brill. Fast Helio 2R | 385.[illegible]5 |
| Brill. Fast Helio 2RS | 177.30 |
| Brill. Fast Helio BS | 116.10 |
| Brill. Violet Extra | 181.45 |
| Blue 2B | 102.50 |
| Blue G | 220.45 |
| Sky Blue FB | 242.00 |
| Copper Blue GR | 190.25 |
| Fast Greenish Blue GL | 114.60 |
| Developed Black BT | 149.95 |
| Blue NB-2B | 348.45 |
| Blue NB-2BG | 214.70 |
| Developed Black NB-GHB | 214.70 |
| Green B | 142.75 |
| Green NB-B | 218.90 |
| Green 2B-N | 218.90 |
| Brown MR | 197.40 |
| Brown CN | 137.00 |
| Golden Brown G | 175.85 |
| Catechin G | 155.70 |
| Omega Tan | 161.45 |
| Catechin GS | 102.80 |
| Black E Hly. Conc. | 180.15 |
| Black E Extra Hly. Conc. | 180.15 |
| Black NB-ER Hly. Conc. | 290.50 |

| DISPERSOL COLOURS | Per Kg. |
|---|---|
| Red B 3B Conc | 611.50 |
| Red B 2B Conc | 797.90 |
| Red CB Powder | 1048.25 |
| Red D2B Powder | 599.85 |
| Violet C 4R Conc. | 1202.70 |
| Blue BG Conc | 580.65 |
| Blue BN Powder | 128.20 |
| Blue D 2R Powder | 586.25 |
| Navy BT Conc | 531.95 |
| Blue B 2G Conc | 577.95 |
| Black BT Conc | 319.50 |
| Blue BR | 482.40 |
| Yellow 7GL | 813.20 |
| Yellow 5RX | 269.90 |
| Yellow 3G | 473.20 |
| Yellow | 140.00 |
| Yellow AL | 167.20 |
| Yellow Brown REL | 311.70 |
| Yellow FFL | 571.40 |
| Gold Yellow GG | 320.80 |
| Pink REL | 593.00 |
| Red BEL | 615.60 |
| Red 2B | 422.4 |
| Red FB | 425.8 |
| Red Violet FBL | 622.0 |
| Orange 3R | 254.2 |
| Violet 3R | 370.5 |
| Violet RL | 355.7 |
| Violet 6R | 638.2 |
| Scarlet RR | 283.5 |
| Rubine 3B | 289.1 |
| Rubine CB | 449.5 |
| Blue GL | 419.0 |
| Blue BGF | 805.8 |
| Navy Blue RE | 359.9 |
| Brown 3REL | 272.8 |
| Black GEL | 420.1 |
| Dark Brown 3B | 411.1 |

| BASE COLOURS | Per K |
|---|---|
| Fast Yellow GC | 77. |
| Fast Orange GC | 128. |
| Fast Scarlet R | 198. |
| Fast Scarlet RC | 128 |
| Fast Scarlet RCR | 105. |
| Fast Scarlet G | 115. |
| Fast Scarlet GN | 92. |
| Fast Scarlet GG | 77. |
| Fast Scarlet GGS | 73. |
| Fast Red B | 233 |
| Fast Red RC | 115 |
| Fast Red R Flakes | 158 |
| Fast Red TR | 181 |
| Fast Red TR Oil | 223 |
| Fast Red RL | 251 |
| Fast Red KB Oil | 251 |
| Fast Bordeaux GP | 236 |
| Fast Garnet GBC | 103 |
| Fast Violet B | 548 |
| Fast Blue BB | 566 |

| NAPHTHOL COLOURS | Per |
|---|---|
| ASG | 30 |
| AS | 20 |
| ASSW | 37 |
| ASBS | 25 |
| ASBO | 26 |
| ASD | 20 |
| ASOL | 24 |

| | |
|---|---|
| R | 369.00 |
| H | 336.05 |
| E | 236 00 |
| L | 249.95 |
| B | 2002.35 |
| T | 2459.45 |
| G | 143.00 |
| G | 538.65 |
| R | 652.60 |

| OCION COLOURS | Per Kg. |
|---|---|
| den Yellow HR | 207.95 |
| . Yellow H4G | 145.65- |
| ra Yellow H-8GP | 168.55 |
| . Yellow HE6G | 214.75 |
| ow G-E4R | 276.05 |
| . Yellow H7G | 332.30 |
| ow M4R | 275.45 |
| ow MGR | 387.65 |
| . Yellow M4G | 201.15 |
| . Yellow M8G | 366.10 |
| ow M3R | 244.70 |
| . Orange H2R | 303.80 |
| . Red H7B | 157.95 |
| . Orange M2R | 313 15 |
| . Red H8B | 213.55 |
| . Scarlet H RN | 245.05 |
| ra Red H-3BP | 179.80 |
| . Red H-F3B | 243.45 |
| . Magenta HB | 182.00 |
| Red M 5B | 160 05 |
| Red M 8B | 218.35 |
| . Pink MB | 137 10 |
| . Magenta MB | 163.65 |
| Purple H-3R | 219.55 |
| Purple H-7R | 175.40 |
| y Blue H 3R | 333.75 |
| Blue H-GR | 406.40 |
| Blue H5G | 207 95 |
| H 5RX | 286.20 |
| Blue H 7G | 213.95 |
| Blue H 7RX | 358.15 |
| uoise HA | 265.05 |
| a Blue H-3RP | 595.30 |
| a Turquoise H 2G P | 181.50 |
| Blue H-FRD | 305.80 |
| Navy Blue H3R | 333.75 |
| Blue H 5RX | 286.20 |
| Navy Blue M3R | 355.70 |
| Brill. Blue MR | 405.60 |
| Brill. Blue M RX | 214.20 |
| Brill. Blue M-G | 226.45 |
| Blue M 4GD | 369.40 |
| Navy Blue M RB | 341.85 |
| Turquoise M-G | 240.30 |
| Brill. Blue M GX | 516.25 |
| Blue 3R Acra Powder | 718.20 |
| Dark Brown H 6R | 248.45 |
| Cobalt Oxide | 285.00 |
| Green H4BD | 287.00 |
| Green H-E4BI | 169.80 |
| Red Brown H IF | 143.25 |
| Orange Brown H 28 | 209.05 |
| Brown M GRN | 188.80 |
| Black H-N | 314.20 |

| SULPHUR COLOURS | Per Kg. |
|---|---|
| Navy Blue | 210.35 |
| Green G | 194.55 |
| Black Grains Extra | 72.25 |
| Black Grains OG | 73.70 |
| Black GXE Conc. | 70 85 |
| Black GXE | 57 90 |
| Black GXR | 69.40 |
| Black Grains 800 | 62.80 |
| Black EXR Grains | 73.70 |
| Black EXR Grains 800 | 59.35 |

| VAT COLOURS (ICI) | Per Kg. |
|---|---|
| Yellow 5G Supra Disperse | 561.85 |
| Yellow 5G Acra Conc | 818 60 |
| Gold Orange 3G Pdr. Fine | 1158 45 |
| Brill. Orange 6R Pdr. Fine | 624 35 |
| Gold Orange 3G Supra Disp | 693 85 |
| Brill. Orange 6RX Powder | 394 30 |
| Brill. Red 3B Pdr. Fine | 1214.15 |
| Brill. Red 3B Supra Disp | 867.45 |
| Brill. Purple 3R Acra Powder | 827 05 |
| Brill. Purple 2R Hly Conc. | 744.25 |
| Brill. Purple 4R Supra Disp. | 604.25 |
| Brill. Purple 2R Acra Conc. | 779.85 |
| Blue 2R Powder Fine | 675.30 |
| Blue BC Acra Con Pdr. Fine | 1013.15 |
| Blue BC Conc. Pdr. Fine | 713.65 |
| Blue R Conc. Pdr. Fine | 719.70 |
| Blue Conc. Powder | 645.80 |
| Brill. Blue 2R Hly. Conc. | 378.55 |
| Blue RR Supra Powder | 629.35 |
| Brill. Blue 2R Supra Disp. | 115.65 |
| Dark Blue 2R Powder Fine | 512.65 |
| Blue BC Supra Disp. | 419.65 |
| Jade Green XBN Powder Fine | 555.80 |
| Jade Green XBN Acra Conc. Pdr | 1026.05 |
| Jade Green 2G Pdr. Fine | 533.25 |
| Jade Green 2G Ptg. Paste | 125.40 |
| Jade Green XBN Ptg. Paste | 126.00 |
| Jade Green 2G Supra Disp. | 618.00 |
| Olive D Pdr. Fine | 563.90 |
| Olive Green B Supra Disp. | 421.70 |
| Jade Green XBN Supra Disp. (N) | 327.30 |
| Olive OMW Powder Fine | 698.55 |
| Olive OMW Supra Disp. | 538.05 |
| Olive D Supra Disp. | 361.70 |
| Olive R Supra Disp. | 470.25 |
| Olive D. Ptg. Paste | 193 00 |
| Olive Green B Ptg. Paste | 199.10 |
| Olive Green B Acra Conc. | 741.10 |
| Olive R Acra Conc. | 779 85 |
| Brown R Pdr. Fine | 869 45 |
| Dark Brown 3R Fine | 826.25 |
| Brown G Supra Disp | 582 05 |
| Brown 2G Supra Disp | 716 10 |
| Brown R Supra Disp | 547 35 |
| Brown BR Powder | 867.75 |
| Dark Brown 3R Ptg Paste | 217 15 |
| Dark Brown 3R Supra Disp | 529 60 |
| Brown G Acra Conc. | 967.95 |
| Brown M. Powder Fine | 768 80 |
| Grey M. Supra Disp. | 585 45 |
| Blue BC Acra Conc. Pdr. Fine | 762.70 |
| Direct Black AC Supra Disp. | 415.75 |
| Direct Black AC Pdr. Fine | 574.70 |
| Direct Black CH Supra Disp. | 190 45 |
| Direct ACD Ptg. Paste | 217.15 |

# Delhi Market

**DELHI: AUGUST 24 NNS** Soda ash Tata suffered a fall of Rs. 7 at Rs. 373 per bag in the Delhi chemicals market during last week, following accumulation of stock combined with poor buying interest from consumers, reports NNS. Similarly soda ash Gujarat and NAL dropped by Rs. 10 each at Rs. 360 and Rs. 365 per bag for want of buying support, whereas soda ash PNFC (Punjab) was not available in the market. Arrivals of Mangla and NAL quality goods was reported about 4 trucks. Prices of ammonia bicarb dropped by Rs. 25 at Rs. 155/25 kg. Soda bicarb NAL also followed suit and drifted lower by Rs. 5 at Rs. 320 per 50 kg. Soda bicarb Tata also ruled quiet at Rs. 315. In the absence of better demand due to rainy weather, tartaric acid Swastik declined by Rs. 15 at Rs. 210 per kg whereas tartaric acid France moved up by Rs. 10 at Rs. 300 because of fall in fresh import from France. Sodium nitrite Deepak marka moved down again by Rs. 50 at Rs. 1,150 for want of buying support. On the other hand caustic soda flakes looked up by Rs. 10 at Rs. 530 per bag.

Paraffin wax jumped up again by Rs. 25 at Rs. 1,100/50 kg due to suspension of supply line combined with spurt in demand from candle manufacturers. Likewise slacks and match wax registered a marked rise of Rs. 100/500 and touched a new level of Rs. 11,600 and Rs. 12,500 per tonne in the wake of negligible supply. Residue wax, on the other hand, ruled quiet at Rs. 3,800. Chatkolite and sufolite moved down by Rs. 1 at Rs. 53 and Rs. 54.50/kg.

As a result of persistent arrivals from Sambhal, Moradabad, Rampur, Chandausi and Amroha areas of U.P. combined with fall in demand from the travellers of Pakistan and Afghanistan, prices of menthol medium and bold receded by Rs: 5/10 at Rs. 305 and Rs. 325/kg. Menthol flake also being offered lower by Rs. 5 at Rs. 285, whereas DMO mentha oil looked up by Rs. 5 at Rs. 92 due to fall in fresh supply. Mercury jumped up by Rs. 100 at Rs. 11,200 per flask in view of scanty supply and encouraging advices from Bombay. Hydrogen peroxide shot up by Rs. 2.50 at Rs. 36.50/kg because of fall in fresh import from Taiwan in view of continued tension in Gulf countries. Titanium dioxide RC-822 hardened by Rs. 2 at Rs. 86 on account of heavy mutual speculation.

## (DELHI MARKET RATES AS ON AUGUST 24, 1990)

| | |
|---|---|
| Ammonia Bicarb (Per 25 Kg.) | 155.00 |
| Mercury (Per flask) | 11,200.00 |
| Soda ash (Per bag) | 360/373.00 |
| Ammonium Chloride (50 Kg.) | 120/180.00 |
| Caustic soda flakes (50 Kg.) | 530.00 |
| Citric acid (Per 50 Kg.) | 1,900/2,350.00 |
| Stable Bleaching Powder Shriram (Per 25 Kg.) | 101.00 |
| Stable Bleaching Powder KCI (Per 25 Kg.) | 90.00 |
| Stable Bleaching Powder Maruti (Per 25 Kg.) | 91.00 |
| Stable Bleaching Powder Modi (Per 25 Kg.) | 92.00 |
| Sodium Bicarbonate (50 Kg.) | 315/325.00 |
| Sodium Hydrosulphite (Per Kg.) | 38.00/41.00 |
| Rangolite (Per Kg.) | 85.00 |
| Tartaric acid France (Per Kg.) | 300.00 |
| Sufolite (Per Kg.) | 56.00 |
| Chatkolite (Per Kg.) | 54.50 |
| DMO (per Kg.) | 90.00 |
| Boric acid Technical (Per 50 Kg.) | 1,525.00 |
| Paraffin Wax (Per 50 Kg.) | 1,110.00 |
| Slack wax (Per metric tonne) | 11,600.00 |
| Tartaric Acid (Swastik Per Kg.) | 225.00 |
| Borax Granular (Per 50 Kg.) | 800.00 |
| Borax Crystal (Per 50 Kg.) | 825.00 |
| Sodium Nitrite (Per 50 Kg.) | 1,050/1,250.00 |
| Sodium Nitrate (Per 50 Kg.) | 500.00 |
| Camphor Thal (Per Kg.) | 110.00 |
| Camphor Powder (Per Kg.) | 96.00 |
| Menthol Bold (Per Kg.) | 325.00 |
| Menthol Medium (Per Kg.) | 310.00 |
| Menthol Flake (Per Kg.) | 285.00 |
| Mentha Oil (Per Kg.) | 198 0 |
| Glycerine (Per Kg.) | 55/58 0 |
| Sodium Silicate (Per quintal) | 300/400 0 |
| Hexamine (Per Kg.) | 34.0 |
| Acetic Acid Glacial (Per Kg.) | 13.7 |
| Copper Sulphate (Per quintal) | 2,300/2,60 |
| Formic Acid (Per Kg.) | 24.0 |
| Formaldehyde (Per Kg.) | 8.5 |
| Hydrogen Peroxide (Per Kg.) | 36.5 |
| Calcium Carbonate (Per Tonne) | 2,800/5,80 |
| Acid Slurry Soft (Per Kg.) | 27.0 |
| Acid Slurry Hard (Per Kg.) | 32.0 |
| Phosphoric Acid (Per 50 Kg.) | 1,235.0 |
| Potassium Nitrate (Per quintal) | 1,000/1,250.0 |
| Potassium Permanganate (Per 50 Kg.) | 2,600/3,000. |
| Sodium Bichromate (Per 50 Kg.) | 1,575/1,600 |
| Trisodium Phosphate (50 Kg.) | 570. |
| Titanium Dioxide Anatase T.T.P. (Per Kg.) | 62. |
| Titanium Dioxide RC-822 (Per Kg.) | 86. |
| Titanium Dioxide Anatase K-Brand (Per Kg.) | 58. |
| Titanium Dioxide RCR-2 (Per Kg.) | N |
| Zinc Oxide (Per Kg.) | 46.00/50. |
| Phenol Carbolic Acid (Per Kg.) | 39. |
| Carbon Tetrachloride (Per Kg.) | 24. |
| Chloroform (Per Kg.) | 28 |
| Sodium Sulphate (Per metric tonne) | 3,600/3,900 |
| Naphthalene Balls (Per 50 Kg.) | 1,375 |
| Match Wax | 12, |
| Residue Wax | 3, |

| DYES & COLOURS | (Per K |
|---|---|
| Naphthol AS | 175/21 |
| Naphthol ASG | 180/24 |
| Naphthol ASBS | 210/26 |
| Naphthol ASTR | 300/37 |
| Naphthol ASOL | 210/25 |
| Naphthol ASBO | 195/27 |

| DIRECT DYES | (Per |
|---|---|
| Black E. Conc. | 120/18 |
| Diazo Black B.T. | 105/15 |
| Green B | 90/14 |
| Blue 2-B | 60/10 |
| Blue 2-B 225% (JNR) | 12 |
| Sky Blue FB | 160/24 |
| Basic Auramine | 55/11 |
| Basic Rhodamine | 300/42 |
| Basic Methylene Blue | 100/18 |
| Basic Violet | 165/21 |
| Basic Malachite Green | 17 |
| Acid Orange | 75/11 |
| Congo Red H/C | 75/12 |

# Madras Market

here has not been much change e prices over the week. Supply tion of sodium nitrite continues e difficult with the price remaining s.24/kg. Supply position of caustic flakes is good but the prices have remained at previous levels. MEK prices have gone up due to short supply. The manufacturers have also put up their prices marginally.

## (MADRAS MARKET RATES AS ON AUGUST 25, 1990)

| | |
|---|---|
| tic Acid Glacial (per kg) | 14.50 |
| ninium Sulphate Iron free er MT) | 3,800.00 |
| nonium Bicarbonate er 25 kgs) | 150.00 |
| nonium Chloride (per MT) | 2,300.00 |
| l Slurry (per kg) | 31.00 |
| um Carbonate (per kg) | 11.00 |
| ium Chloride (per kg) | 10.00 |
| ic Acid Technical (per kg) | 28.00 |
| aching Powder (per 50 kgs) | 220.00 |
| ax (per 50 kgs) | 785.00 |
| ustic Soda Flakes -- Mettur Chemicals (per MT) | 11,500.00 |
| ustic Soda Flakes -- Andhra Sugars (per MT) | 11,500.00 |
| cium Chloride 70% Solid per MT) | 3,500.00 |
| lcium Chloride Anhydrous per MT) | 6,500.00 |
| lcium Carbonate (Activated) per MT) | 6,600.00 |
| lcium Carbonate (Precipitated) (per MT) | 5,500.00 |
| ric Acid (per kg) | 48.00 |
| pper Sulphate (per kg) | 25.00 |
| esylic Acid 98-99% (per kg) | 135.00 |
| re Para Cresol 96% (per kg) | 85.00 |
| eta Para Cresol 42% (per kg) | 51.00 |
| rmic Acid (per kg) | 27.00 |
| rmaldehyde (per kg) | 8.00 |
| ue Flakes (per kg) | 15.00 |
| ycerine I.W. (per kg) | 49.00 |
| ydrosulphite of Soda (TCPL) (per kg) | 38.00 |
| ydrosulphite of Soda (IDI) (per kg) | 42.00 |
| Hydrosulphite of Soda (BASF) (per kg) | 48.00 |
| Hexamine (per kg) | 31.00 |
| Hyflosupercell (per kg) | 23.00 |
| Hydrogen Peroxide (per kg) | 33.00 |
| Litharge (per kg) | 38.00 |
| Lead Acetate (per kg) | 38.00 |
| Magnesium Carbonate (per kg) | 16.00 |
| Magnesium Chloride (per kg) | 3.50 |
| Maleic Anhydride (per kg) | 40.00 |
| Menthol Crystals (per kg) | 345.00 |
| Oxalic Acid (per kg) | 18.50 |
| Paraffin Wax (per kg) | 19.00 |
| Potassium Bichromate (per kg) | 36.00 |
| Phosphoric Acid (per kg) | 28.00 |
| Polyvinyl Alcohol Powder (per kg) | 140.00 |
| Pentaerythritol (per kg) | 52.00 |
| Phthalic Anhydride (per kg) | 32.00 |
| Soda Ash (TAC) (per 75 kgs) | 410.00 |
| Soda Ash (TATA) (per 75 kgs) | 410.00 |
| Sodium Bicarbonate (TATA) (per 50 kgs) | 385.00 |
| Sodium Silicate (per MT) | 3,800.00 |
| Sodium Bichromate (per kg) | 28.00 |
| Sodium Nitrate (per kg) | 8.00 |
| Sodium Nitrite (per kg) | 24.00 |
| Sodium Sulphide Flakes (per kg) | 18.00 |
| Sodium Bisulphite (per kg) | 8.00 |
| Sodium Alginate (per kg) | 295.00 |
| Sodium Acetate (per kg) | 7.50 |
| Sodium Sulphate (Anhydrous) (per kg) | 3.85 |
| Titanium Dioxide (Anatase) (per kg) | 63.00 |
| Titanium Dioxide (Rutile) (per kg) | 85.00 |
| Trisodium Phosphate (per kg) | 10.00 |
| Urea (Technical) (per kg) | 3.00 |
| Zinc Oxide (per kg) | 54.00 |
| Zinc Chloride Powder (per kg) | 14.00 |
| Zinc Sulphate (per kg) | 9.00 |

### SOLVENTS

| | |
|---|---|
| Acetone -- HOCL (per kg) | 18.50 |
| Butanol (per kg) | 35.00 |
| Butyl Acetate (per kg) | 42.00 |
| Benzene (per lit) | 14.00 |
| Cellosolve (per kg) | 65.00 |
| Carbon Tetra Chloride (per kg) | 23.00 |
| Chloroform (per kg) | 28.00 |
| Diacetone Alcohol (per kg) | 30.00 |
| Diethylene Glycol (per kg) | 30.00 |
| Dichloroethane (per kg) | 18.00 |
| Di-octyl Phthalate (per kg) | 46.00 |
| Di-N-butyl Phthalate (per kg) | 46.00 |
| Ethyl Acetate (per kg) | 18.00 |
| Isopropyl Alcohol (per kg) | 28.50 |
| Methanol (per kg) | 10.00 |
| Methylene Chloride (per kg) | 23.00 |
| Methyl Ethyl Ketone (per kg) | 36.00 |
| Methyl Isobutyl Ketone (per kg) | 41.25 |
| Phenol (per kg) | 38.00 |
| Sorbitol (per kg) | 14.00 |
| Triethanolamine (per kg) | 90.00 |
| Trichloroethylene (per kg) | 26.00 |
| 1-1-1 Trichloroethane (per kg) | 29.00 |
| Turpentine (per lit) | 16.00 |
| Toluene (per lit) | 14.00 |
| Xylene (per lit) | 20.00 |

## CALCUTTA MARKET
## (Prices as on August 28, 1990)

| | |
|---|---|
| Acetic acid (per 50 kg) | 750.00 |
| Basic chrome sulphate (per 50 kg) | 800.00 |
| Benzene (litre) | 11.50 |
| Bleaching powder (bag) | 235.00 |
| Borax granular (per 50 kg) | 800.00 |
| Boric acid (per 50 kg) | 1,625.00 |
| Camphor (per kg) | 102.00 |
| Caustic soda lye (per ton) | 10,020.00 |
| Caustic soda flakes (per 50 kg) | 560.00 |
| Glycerine (per kg) | 53.50 |
| Menthol bold (per kg) | 570.00 |
| Menthol medium (per kg) | 380.00 |
| Menthol small (per kg) | 300.00 |
| Phosphoric acid (per 50 kg) | 1,400.00 |
| Phenol (per kg) | 38.50 |
| Soda ash (75 kg) | 395.00 |
| Sodium bichromate (per 50 kg) | 1,500.00 |
| Sodium bicarbonate (per 50 kg) | 340.00 |
| Sodium nitrate (per 50 kg) | 450.00 |
| Sodium sulphate anhydrous (per 50 kg) | 320.00 |
| Sulphuric acid (per ton) | 2,200.00 |
| Trisodium phosphate (per 50 kg) | 610.00 |
| Toluene (litre) | 16.50 |

# Shipping News

## VESSELS DUE IN BOMBAY FOR EXPORT LOADING

| Due Date (1) | Steamer's Name & Flag (2) | Agents (3) | Will load for (4) | Approx. sailing dt (5) |
|---|---|---|---|---|
| 3/9 | Pavel Mizikevich (Rus) | Transocean/ | Tilbury; Avonmouth; Liverpool; Manchester; London; Felixstowe; Birmingham; Antwerp; Rotterdam; Hamburg; Bremen; Copenhagen; Gothenburg; Oslo; Stockholm; Malmao; Leeds. (Crtg. at T.P. No. 3). | 7/9 |
| | | I.S.S. Co. | Felixstowe; Tilbury; Antwerp; Rotterdam; Hamburg; Bremerhaven; & Scandinavian Ports via Hamburg. (Carting at E-Grain Depot). | |
| 5/9 | Menkar | P&O/<br>Arebee | Assab; Djibouti; P. Sudan. (Carting at Timber Pond No. 3).<br>P. Said; Alexandria; Piraeus; Venice; Trieste; Genoa; Koper; Naples; Fos; Barcelona; Valencia; Ravenna; Livorno; Las Palmas; Limmasol; Constanza; Budapest. (Carting at M-Jetha Cotton Depot). | 8/9 |
| 3/9 | CMB Merkur (Nhava Sheva) | C.M.B./ Merzario | Port Sudan; Jeddah; La Spezia; Valencia; Genoa; Barcelona; Marseilles; Tunis; Casablanca; Tangier; Alexandria; Piraeus; Mersin; Limassol; Felixstowe; London; Liverpool; Manchester; Birmingham; Avonmouth; Dublin and all inland destinations in U.K.; Antwerp; Rotterdam; Hamburg; Bremen; Leixoes; Lisbon; Copenhagen; Oslo; Gothenburg; Stockholm; Malmao; Aarhus; Helsinki. (Carting at Kalamboli for both). | 5/9 |
| 30/8 | Dorothee (Ger) | Samrat/ Hindustan | Felixstowe; Hamburg; Rotterdam; Also London; Liverpool; Leixoes; Lisbon; Manchester; Avonmouth; Wembly; Birmingham; Leicester; Le Havre; Bremen; Amsterdam; Antwerp; Copenhagen; Leeds; Aarhus; Gothenburg; Oslo; Helsinki; Stockholm; Belfast & all destination in U.K.; Benelux; Germany; Italy; France; Switzerland & Austria. (Carting at M.O.D. No. 1 for Samrat & Hindustan). | 5/9 |
| | | Killick | Felixstowe; Rotterdam; Hamburg; Atnwerp; Le Havre; Lisbon; Leixoes; London; Liverpool; Manchester; Bristol; Avonmouth; Leeds; Glasgow; Tilbury; Birmingham; Dublin; Belfast; Bremen; Bremerhaven; Aarhus; Copenhagen; Gothenburg; Helsinborg; Oslo; Helsinki; Alexandria; Lattakia; Mersin; Malta; Limassol; Piraeus. (Carting at E-Shed Grain Depot). | |
| 3/9 | Vishva Parimal (Ind) | S.C.I. | P. Said; Felixstowe; Hamburg; Rotterdam; Antwerp; Bremen; Liverpool; Manchester; Avonmouth; London; Belfast; Aarhus; Oslo; Helsinki; Copenhagen; Gothenburg and all inland destinations. (Carting at T.P. No. 1). | 7/9 |
| 1/9 | Moji | Silvership | Chittagong. (Carting at Timber Pond No. 3). | 6/9 |
| 1/9 | Moji (Voy-23) | U.L.A./ | Singapore; Penang; P. Kelang; Keelung; Kaohsiung; Bangkok; Busan; Jakarta; Hongkong; Japan and Chinese Ports. (Carting at M-171/173 Cotton Depot). | 6/9 |
| | | Samrat/ | Singapore (Direct); Penang; Jakarta; Surabaya; Belawan; P. Kelang; Bangkok; Manila; Hongkong; Kaohsiung; Keelung; Taichung; Busan; Yokohama; Nagoya; Kobe; Osaka; Tokyo. (Carting at Mallet Bunder). | |
| | | Trident/ | Busan; Hongkong; Keelung; Kobe; Nagoya; Yokohama; Penang; P. Kelang; Bangkok; Kaohsiung; Singapore. (Carting at T.P. No. 4). | |
| | | E.S.P.L./ | Singapore; Hongkong; Bangkok; Jakarta; Kaohsiung; Keelung; Penang; P. Kelang; Kota; Kinabulu; Kulaubelati; Bintulu; Kuching; Labuan; Vietnam. (Carting at M-172 Cotton Depot). | |
| | | I.M.E./ | Singapore; Bangkok; Hongkong; Keelung; Busan; Kobe; Yokohama; Nagoya. (Carting at Wadi Bunder No. 3). | |
| | | P&O/ | Far East & S. East Asian Ports. (Carting at Timber Pond No. 3). | |
| | | Sarada/ | Bangkok; Hongkong; Chinese Ports. (Carting at M-172 Cotton Depot). | |
| | | Silvership | Far East and Japan Ports. (Carting at T.P. No. 3). | |
| 1/9 | Moji | Samrat/ | Brisbane; Sydney; Melbourne; Adelaide; Fremantle; Burnie. (Carting at Mallet Bunder). | 6/9 |
| | | Trident/ | Brisbane; Sydney; Melbourne; Adelaide; Fremantle; Burnie; Auckland; Wellington; Lyttleton. (Carting at T.P. No. 4). | |
| | | Arebee/ | Sydney; Melbourne; Adelaide; Brisbane. (Carting at M-Jetha Cotton Depot). | |
| | | Transworld/ | Sydney; Melbourne; Adelaide; Fremantle; Burnie; Brisbane. (Carting at CFS Cotton Avenue). | |

| (2) | (3) | (4) | (5) |
|---|---|---|---|
| | E.S.P.L. | Sydney; Melbourne; Adelaide; Fremantle. (Carting at M-172 Cotton Depot). | |
| | Silvership | Australia and New Zealand Ports. (Carting at T.P. No. 3). | |
| Menkar (V-07) | Arebee/ | Dar Es Salaam & Mombasa (Direct); Kampala; Jinja; Toronto; Lugazi; Entebee (Uganda); Kigali (Rwanda); Kitwe; Lusaka; Ndola (Zambia); Lilongwe; Blantyre (Malawi); Maputo; Zanzibar. (Carting at M.J. Cotton Depot). | 8/9 |
| | P & O | Mombasa; Dar Es Salaam (Direct); Beira; Mahe and inland destinations in East Africa. (Carting at Timber Pond No. 3). | |
| Vishva Kaumudi (Ind) | S.C.I. | Seychelles; P. Louis; Mombasa; Dar Es Salaam; Beira. (Carting at T.P. No. 1). | 7/9 |
| Moji | Seahorse | Port Louis. (Carting at M.O.D. No. 3). | 6/9 |
| Pavel Mizikevich | Marathon | Boston; New York; Baltimore; Norfolk. (Carting at T.P. No. 3). | 7/9 |
| CMB Merkur (Nhava Sheva) | C.M.B. | Norfolk; New York; Baltimore; Phialdelphia; Charleston; Savannah; Houston; Miami; New Orleans via Antwerp; Montreal; Toronto; Halifax. (Carting at Kalamboli). | 5/9 |
| Moji (Voy-23) | Samrat/ | Longbeach; Oakland;Seattle; Los Angeles; San Francisco; Philadelphia; Savannah; Charleston; Baltimore; Norfolk; New York; Boston; St. John; Vancouver; Montreal; Toronto; New Orleans; Houston. (Carting at M.B.). | 6/9 |
| | U.L.A./ | Los Angeles; San Francisco; Oalkland; Seattle; Vancouver; Charleston; Houston; Norfolk; Baltimore; New York; Halifax; Montreal; Toronto; West Indies Ports. (Carting at M-171/173 Cotton Depot). | |
| | F.S.P.L./ | Longbeach; Charleston; New York; St. John; Norfolk; Oakland; Vancouver (B.C.): Seattle; Montreal; Baltimore; Boston; Chicago; Dallas; Houston; Longview; Los Angeles; New Orleans; Philadelphia; Portland; San Diego; Mexico City; San Francisco; Siouxfall; Sacramento; Stockton; Halifax; Toronto; Savannah; Tacoma; Miami; and all other destinations. Also Caribbean Ports. (Carting at M-172 Cotton Depot). | |
| | Trident/ | S. American; Caribbean and Central American Ports. (Carting at T.P. No. 4) | |
| | Arebee | S. American Ports. (Carting at M-Jetha Cotton Depot). | |
| Vishva Parimal (Ind) | S.C.I. | New York; Baltimore; Savannah; Norfolk; Charleston; Houston; Jacksonvile; New Orleans; Boston; P. Everglades. (Carting at T.P. No. 1). | 7/9 |
| Menkar (Voy-07) (Cyp) | Arebee | Lagos/Apapa; P. Harcourt; Abidjan; Tema; Takoradi; Monrovia; Lome; Freetown; Cotonou; Douala; Matadi. (Carting at M-Jetha C.D.). | 8/9 |
| CMB Merkur (Nhava Sheva) | C.M.B. | Lagos; Abidjan; Lome; Douala; Matadi; Port Gentil; Pointe Noire; Nouakchott; Cotonou; Dakar; Luanda; Monrovia; Tema via Antwerp. (Carting at Kalamboli). | 5/9 |
| Moji | U.L.A./ | Lagos/Apapa; Abidjan; Lome/Matadi. (Carting at M-171/173 C.D.). | 6/9 |
| | Trident | Tema/Lome; Lagos; Matadi; Lobito; Luanda; Freetown; Cotonou; Douala; P. Harcourt; Abidjan; Monrovia; Dakar. (Carting at T.P. No. 4). | |

## VESSELS DUE FOR IMPORT DISCHARGE

| e Date | Steamer's Name | Agents | From |
|---|---|---|---|
| | Piva | S.C.I. | U.K. Cont. |
| | Vrontados | Sai Ship | S. America |

ACME'S ADSORBENTS
FOR

THIN-LAYER CHROMATOGRAPHY
SILICA GEL - G & $GF_{254}$
SILICA GEL - H & $HF_{254}$
CELLULOSE POWDER - G
KIESELGUHR - G
MICROCRYSTALLINE CELLULOSE

COLUMN CHROMATOGRAPHY
SILICA GEL of all Mesh Sizes
ALUMINIUM OXIDE ACIDIC,
BASIC & NEUTRAL
CELLULOSE POWDER
KIESELGUHR

AND TAILOR MADE SILICA GELS FOR SPECIAL APPLICATIONS
TLC EQUIPMENTS AND U.V. CHROMO-CAB (U.V. LAMP)
LIPID CHEMICALS OF 99+% PURITY, SODIUM CAPRYLATE,
UNDECYLENIC ACID & HEPTALDEHYDE

Manufactured by

asc

**acme synthetic chemicals**

308, Veer Savarkar Marg, Bombay 400 028.
Telephone: 465127 - 452706 * Gram: ACMESOAP

FOR YOUR REQUIREMENTS OF BULK DRUGS SUCH AS

Chloramphenicol Powder I.P.
Chloramphenicol Palmitate I.P.
Piperazine Citrate I.P.
Piperazine Hexahydrate I.P.
Piperazine Phosphate I.P.
Piperazine Adipate I.P.

Potassium Citrate I.P.
Sodium Citrate I.P.
Aminophylline I.P.
Potassium Iodide I.P.
Iodine I.P.
Diethyl Carbamazine Citrate I.P.

Sodium Iodide
Erythromycine Stearate I.P.
Erythromycine Estolate I.P.
Erythromycine Ethyl Succinate I.P.
Potassium Iodate I.P.
Di-sodium Hydrogen Citrate B.P.

&

All other BULK DRUGS, kindly contact us at our office address
Avail Modvat benefit and No S.T./C.S.T.

**Gayatri Laboratories Pvt. Ltd.**

**Factory:**
E-64, Road No. 7, M.I.D.C.,
Tarapur, Boisar 401 502.
Dist. Thana, Maharashtra.

**Adm. Office:**
26/3, Jay Mahal Estate, Kitchen Garden Lane,
Princess Street, P.B. No. 2273,
Bombay 400 002.

Phone: 251124, 257375, 257376, 254335 Resi.: S-6282551, R-6825642 Gram: "VIKASHDRUGS", Bombay 400 002.
Telex: 4932 G.L.P.L IN
Export Enquiries Solicited

For Your Requirements Of:

**ACETONE** (In Drums & Tanker Load)
**ETHYL ACETATE** (In Drums & Tanker Load)
**TOLUENE** (In Drums & Tanker Load)

ACETIC ACID
ANILINE OIL
BENZENE
BUTANOL
BUTYL ACETATE
CYCLOHEXANONE

FORMALDEHYDE
ISOPROPYL ALCOHOL
D.M.T.
M.E.K. * M.I.B.K.
PHENOL
XYLENE

Please Contact:

**KOMAL TRADING CO.**

501/9, New Anant Bhuvan, 5th Floor, Narsi Natha Street, Bombay 400 009.
Telephone: Office: 8552305 Resi.: 5602299

# Materials Imported/Exported

## MATERIALS IMPORTED FROM BOMBAY

**(From 1.5.90 to 14.5.90)**

**ontinued from previous issue**

IERCAPTO PROPIONIC ACID: n USA: Indofil Chemicals Co., 500 ., Rs. 36,448.

IERCURY METAL: From Japan: eshdas & Sons, 1,725 Kgs., 2,11,598.

IETHYL CEDRYL KETONE: m Netherlands: The Tata Oil Mills Ltd., 150 Kgs., Rs. 70,434.

IETHYL DICHLORO ACETATE: m Japan: Themis Agencies, 3,000 s., Rs. N.A.

IETHYL PARATHION TECH: m GDR: Gupta Chemicals Pvt. Ltd., 600 Kgs., Rs. 6,73,490.

MONOCROTOPHOS TECHNI- L: From Switzerland: Pesto Chem lia, 16,280 Kgs., Rs. 15,84,845.

MONO SODIUM GLUTAMIC CID: From Korea: Kiran Kotak & ., 36 Mts., Rs. 6,72,228.

MURIATE OF POTASH: From rdan: Indian Potash Ltd., 16,600 Mts., . 3,81,22,694.

NEO PENTYL GLYCOL: From FRG: Refuel Oil Refineries, 2,000 Kgs., Rs. 55, 303.

NOVALDIAMINE: From Malaysia: Colgate Palmolive (I) Ltd., 3,135 Kgs., Rs. 12,90,762.

OCTOIC ACID: From Malaysia: Colgate Palmolive Ltd., 28,800 Kgs., Rs. 4,70,104.

ORTHO CHLORO TOLUENE: From Japan: Chemicrux, 1,380 Kgs., Rs. 2,46,963.

ORTHOCRESOL: From FRG: Chemiequip Ltd., 600 Kgs., Rs. 21,043.

PARA CHLORO TOLUENE : From Japan: Gujarat Insecticides Ltd., 30,000 Kgs., Rs. 8,22,093.

PARAFORMALDEHYDE: From Spain: Henkel Chemicals India Ltd., 18,000 Kgs., Rs. 1,43,893.

PARA HYDROXYL PHENYL-ACETAMIDE: From Japan: Trichem Laboratories, 600 Kgs., Rs. 4,99,967.

PARA NITRO ANILINE: From Malaysia: Colgate Palmolive (I) Ltd., 3,000 Kgs., Rs. 83,870; Colgate Palmolive (I) Ltd., 2,000 Kgs., Rs. 1,96,205; From China: Pridar Chemicals & Extraction, 4,350 Kgs., Rs. 2,08,771.

PERCHLORO ETHYLENE: From Spain: Prohbex Aids, 19,200 Kgs., Rs. 1,50,937; From UK: Prohbex Aids, 20.16 Mts., Rs. 1,54,801.

PHENYL XYLYL ETHANE: From Japan: Mahan Electrical Inds., 10,000 Kgs., Rs. 2,79,223; Shreram Capacitors, 20,000 Kgs., Rs. 5,58,445.

POLYOL: From UK: Godrej & Boyce Mfg. Co. 15.84 Mts., Rs. 4,46,988; From UK: Greaves Cotton & Co., 15.8 Mts., Rs. 4,46,988.

POLYVINYL ALCOHOL: From Japan: Mafatlal Dyes & Chemicals, 11 Mts., Rs. 4,41,520; Triveni Chemicals Co., 17 Mts., Rs. 5,85,663.

POLYVINYL PYROLIDONE: From USA: IDPL, 2,000 Kgs., Rs. 4,77,128.

PROPYLENE GLYCOL: From FRG: Asian Paints (I) Ltd., 17.2 Mts., Rs. 2,70,147.

PROPYLENE GLYCOL (TECH): From FRG: Chemo Industries, 19.2 Mts., Rs. 2,80,652; From Japan: Hi Tech Polymers, 8.19 Mts., Rs. 1,35,780; Renuka Chemicals, 5,250 Kgs., Rs. 88,551; West Coast Chem & Allied, 5,250 Kgs., Rs. 88,551.

PTBCHA: From Malaysia: Colgate Palmolive (I) Ltd., 16 Mts., Rs. 2,62,095.

TERT. BUTYL HYDROQUINONE: From Malaysia: Colgate Palmolive (I) Ltd., 200 Kgs., Rs. 66,315.

For your requirements of

**MIXED XYLENE** (Ex-Kandla-Naked)

- PHTHALIC ANHYDRIDE
- PHENOL
- DIACETONE
- D.M.A. 40% (R.C.F.)
- TRIETHYLAMINE
- ACETONITRILE
- ACRYLONITRILE
- D.E.G.
- M.E.G.
- ORTHO XYLENE
- SOLVENT C-IX
- I.P.A. (NOCIL/Refilled)
- E.D.C. (Refilled/Distilled)

Note: Excise Gate Pass will be given for MODVAT Benefit

Please Contact:

**BEEKAY ENTERPRISES**

503, Faiz-e-Qutbi, 375, Narsi Natha Street, Bombay 400 009
Phones: Office: 349080/345011/348475/322958; Resi.: 5121572/5124452 Telex: 011-71707 BKE IN

TETRA POTASSIUM PYRO PHOSPHATE FOOD GR: From UK: Colgate Palmolive (I) Ltd., N.A., Rs. 37,923.

THIOPHENATE METHYL: From Japan : Motilal Pesticides (I) Ltd., 2,500 Kgs., Rs. 2,33,486.

TITANIUM DIOXIDE: From China: Sampada Enterprises, 8,750 Kgs., Rs. 1,95,625; From FRG: Pasupati Acrylon Ltd., 5 Mts., Rs. 2,44,320; From USA: Asian Paints (I) Ltd., 15,000 Kgs., Rs. 66,01,336.

TITANIUM DIOXIDE PIGMENTS: From USA: Perfect Colourants & Plastics, 15 Mts., Rs. 6,80,605; Rainbow Ink & Varnish Mfg. Co., 15 Mts., Rs. 6,80,605; From FRG: Shree Synthetics Ltd., 6,000 Kgs., Rs. 3,03,654; 3,000 Kgs., Rs. 1,46,592; Coates of India Ltd., 15,000 Kgs., Rs. 6,80,604

TRIACETIN: From UK: Precitex Rubber Components, 3,120 Kgs., Rs. 93,962; Precitex Rubber Inds., 3,120 Kgs., Rs. 93,962.

TRIETHYL ALUMINIUM: From Malaysia: Colgate Palmolive (I) Ltd., 6,400 Kgs., Rs. 9,13,316.

2,4,5 TRICHLORO ANILINE: From Japan: Colour Chem Ltd., 1,500 Kgs., Rs. 2,24,146.

TRIETHYLENE GLYCOL: From Japan: Hima Dyechem Corpn., 4,050 Kgs., Rs. 89,337.

3,4,5 TRIMETHYL BENZALDEHYDE: From China: 500 Kgs., Rs. 1,75,400.

2,4,6 TRIMETHYLANILINE: From Switzerland: IDI, 1,200 Kgs., Rs. 2,13,417.

TRIMETHYLOL PROPANE: From Sweden : Resins and Plastics Ltd., 3,00 Kgs., Rs. 86,384.

SUCCINIC ACID: From Australia: Sandoz (India) Ltd., 2,000 Kgs., Rs. 1,52,491.

SODIUM ETHYLENE SULPHONATE: From Malaysia: Colgate Palmolive (I) Ltd., 1,180 Kgs., Rs. 62,614

SODIUM FLUORIDE: From UK: Colgate Palmolive (I) Ltd., 320 Kgs., Rs. 19,546.

SODIUM MONO FLUOROPHOSPHATE: From USA: Nirma Chem Works, 500 Kgs., Rs. 37,084.

SODIUM PICRAMATE: From France: BASF India, 2995 Kgs., Rs. 5,70,662.

STANNOUS OCTOATE: From Switzerland: Nufoam Inds., 150 Kgs., Rs. 25,130.

STYRENE MONOMER: From Netherlands: M. Champak & Co., 17,600 Kgs., Rs. 35,33,218; From USA: Satyan Chem Inds., 17,600 Kgs. Rs. 3,50,145.

2,4 XYLIDINE: From Switzerland IDI, 2,000 Kgs., Rs. 1,65,226.

2,5 XYLIDINE: From Switzerland Devarsons Pvt. Ltd., 1,000 Kgs Rs. 89,497.

2,6 XYLIDINE: From Switzerland Jal Ltd., 4,000 Kgs., Rs. 5,46,163.

VANILLIN: From France: S.H Kelkar & Co. Ltd., 12,000 Kgs Rs. 41,62,195; From Malaysia: Colgat Palmolive (I) Ltd., 3,000 Kgs Rs. 7,90,548

---

## PLASTICS MATERIALS IMPORTED BOMBAY

### (From 1.5.90 to 14.5.90)

HDPE: From Argentina: Ellor Chemical Works, 60 Mts Rs. 8,69,689; Ellora Chemical Work 35 Mts., Rs. 5,06,963; Ellora Chemic Works, 100 Mts., Rs. 14,48,465; Ja Plastics, 50 Mts., Rs. 7,66,585; Kin Plastics, 55 Mts., Rs. 8,16,853., 20 Mts Rs. 2,96,674; From Czechoslovaki Associated Plastic Inds., 12.5 Mts Rs. 1,47,031; Associated Plastic Inds 50 Mts., Rs. 5,68,124.

NIRMA'S New Product :
GLYCERINE (REF/CP/IW)
(Manu :- by M/s NIRMA PVT. LTD.)

Available in Ready Stock:

Contact : M/s ADVENTURE

57, Embassy Market, Near Dinesh Hall,
Ashram Road, Ahmedabad-380 009.

Phone : (O.) 448996 (R.) 461496
Telex : 0121-6343 SKET-IN
Attn. : Ph. 448996
Fax : 91-272-468542 : Attn. Ph. 448996

rdik Inds. corpn., 25 Mts.,
2,84,062; Hardik Inds. Corpn.,
500 Mts., Rs. 4,26,093; Kalpesh
tic Industries, 25 Mts., Rs. 2,84,062;
n Japan: Jhaveri Polymers Pvt. Ltd.,
Mts., Rs. 5,05,101; From Japan:
la Packaging Pvt. Ltd., 32 Mts.,
5,49,394; From Korea: Garware
ll Ropes Ltd., 50,000 Kgs.,
8,39,865; Garware Supermarket, 10
., Rs. 1,52,413; Garware Supermar-
Pvt. Ltd., 40 Mts., Rs. 6,09,652;
m Korea: Priyadarshini Filaments, 6
., Rs. 1,01,011; Sanjeevani Enter-
es, 10 Mts., Rs. 1,68,351; Vikram
rnational, 10 Mts., Rs. 14,097; From
laysia: Colgate Palmolive (India)
nited, 12.5 Mts., Rs. 1,42,031; Col-
e Palmolive (I) Ltd., 57 Mts.,
8,10,052; Colgate Palmolive (I)
., 12.5 Mts., Rs. 1,42,031; From
di Arabia: Associated Plastic Indus-
s., 150 Mts., Rs. 2,70,859; Colum-
Leasing & Finance Limited, 370.15
., Rs. 50,90,946; Fibro Plast Corpn.,
75 Mts., Rs. 3,40,391; Multifilm
stics Pvt. Limited, 150 Mts.,
2,85,824; From Saudi Arabia: Plas-
Processors, 68.45 Kgs., Rs. 8,11,081;
vi International, 17.15 Mts.,
2,78,618; Satyanarayan Plastic
s., Rs. 102.9 Mts., Rs. 16,20,664;
i Salasan Plastics Private Limited,
) Mts., Rs. 2,85,823; Shailesh
gineering & Plastics, 34.30 Kgs.,
5,56,683; Unilite Industries, 17.15
s., Rs. 2,72,355; V. Plast, 150 Mts.,
2,70,858; From USA: A.C. Weav-
& Lamination Limited, 14.375 Mts.,
1,93,165; Associated Plastic Indus-
s, 20 Mts., Rs. 2,60,026; Climax
nthetic Co., 21.25 Mts., Rs. 2,85,549;
shna Pack, 17.5 Mts., Rs. 2,74,860;
n Asia International, 87.5 Mts.,
13,28,480; Maskara Plastic Indus-
es, 17.500 Mts., Rs. 2,74,661; From
goslavia: Gaurav Products, 30 Mts.,
5,30,868; Fortuna Agencies, 5 Mts.,
82,745; Fortuna Agencies, 25 Mts.,
4,13,725; Kamlax Polyester Private
d., 30,000 Kgs., Rs. 5,22,861; Mono-
Plastics, 30 Mts., Rs. 5,30,868; Pan
ia International Pvt. Ltd., 30 Mts.,
5,07,350

LDPE: From FRG: Ifiunik Pharmaceuticals Ltd., 5 Mts., Rs. 1,08,489; Ifiunik Pharmaceuticals Ltd., 5 Mts., Rs. 1.08,489; From Saudi Arabia: Suvin Co-Extrusions Pvt. Limited, 16,500 Kgs., Rs. 2,43,316; From Yugoslavia: Mayank Chemi Plast Pvt. Ltd., 9 Mts., Rs. 1,34,143; Mayank Chemi Plast Pvt. Ltd., 9 Mts., Rs. 1,34,143; Vindhya Telelinks Ltd., 180 Mts., Rs. 26,83,342.

LLDPE: From Netherlands: Suvin Coextrusions Pvt. Ltd., 15 Mts., Rs. 2,39,084; From Saudi Arabia: IPCL, 33 Mts., Rs. 5,08,870; Plasto Metachem, 116.9 Mts., Rs. 1,54,63,443; The Supreme Indus. Ltd., 16.5 Mts., Rs. 1,85,797, VIP Industries Ltd., 99 Mts., Rs. 14,42,620.

LLDPE RESIN: From Netherlands: The Supreme Industries Ltd., 15 Mts., Rs. 2,17,270; The Supreme Industries Ltd., 15 Mts., Rs. 2,17,270.

POLYESTER RESIN: From Korea: Prem Exports, 9,000 Kgs., Rs. 2,32,814; From UK: Vindya Telelinks Ltd., 15,000 Mts., Rs. 4,05,495.

POLYETHYLENE GRANULES: From Turkey: Multan Corp. House, 48 Mts., Rs. 7,42,672.

POLYPROPYLENE: From Belgium: Panorama Plastics, 7.5 Mts., Rs. 1,12,562; Panorama Plastics, 7.5 Mts., Rs. 1,25,562; Panorama Plastics, 7.5 Mts., Rs. 1,25,562; From France: Cosmo films Ltd., 45,375 Kgs., Rs. 6,80,206; From Japan: Diamond Polyplastics, 10,000 Kgs., Rs. 1,51,063; From Italy: Joshi Formulabs Pvt. Ltd., Rs. 15,000 Kgs., Rs. 2,22,505; From Malaysia: Colgate Palmolive (I) Ltd., 49.5 Mts., Rs. 6,56,523; From Spain: Flour & Food Ltd., 15,000 Kgs., Rs. 20,07,988; From Korea: Primo Pick N Pack Pvt. Ltd., 10 Mts., Rs. 1,47,303; From UK: Indo Burma Trading Corporation, 42.925 Mts., Rs. 6,85,813; Universal Cables Ltd., 95 Kgs., Rs. 6,167; From USA: Ananthrai Harivallabhdas, 66 Mts., Rs. 10,94,205.

**For Your Regular Requirements Of:**

**PHENOL**

Please Contact

**SONKAMAL ENTERPRISES**

9, Khimji Meghji House, 11/15, Issaji Street,
Vadgadi, Bombay 400 003.

**Phones: Office: 330352/344797 Resi.: 6367846**

From USA: Columbia Leasing & Finance Ltd., 16.65 Mts., Rs. 2,26,811; From USA: Cosmo Films Ltd., 105 Mts., Rs. 14,88,620; Hardik Indus. Corpn., 66 Mts., Rs. 8,55,364; Garware Wall Ropes Ltd., 49.95 Mts., Rs. 6,10,188; Liberty Trading, 34 Mts.; Rs. 4,15,354; Mahesh Plastics, 33.203 Mts., Rs. 4,43,271; Panchavadi Polyfibres Ltd., 17 Mts., Rs. 2,43,272; Rajasthan Petro Synthetics Ltd., 30,000 Kgs., Rs. 3,97,892; Spage Age Chem Plast Pvt. Ltd., 33.30 Mts., Rs. 4,36,624; Vishal Plastomers Pvt. Ltd., 16.329 Mts., Rs. 2,03,522; Universal Polychem, 16.25 Mts., Rs. 1,81,585.

POLYPROPYLENE HOMOPOLYMER: From Belgium: Pan Asia Intl., 15 Mts., Rs. 1,81,150; From Canada : Apurva Impex, 30 Mts., Rs. 43,450; Plastica, 30,000 Kgs., Rs. 4,16,216; Grover Overseas Pvt. Ltd., 75 Mts., Rs. 10,20,900; From Malaysia: Colgate Palmolive (I) Ltd., 30,000 Kgs., Rs. 4,16,216; From USA: Rajasthan Petrosynthetics, 30 Mts., Rs. 3,97,892.

POLYSTYRENE: From Korea: Blow Pack, 8.17 Mts., Rs. 3,06,868; Brindco Sales Pvt. Ltd., 24,000 Kgs., Rs. 5,95,711; Deluxe Sales Corpn., 17 Mts., Rs. 2,46,422; Khemta Containers Pvt. Ltd., 12 Mts., Rs. 2,95,685; Prem Exporters, 8,000 Kgs., Rs. 2,03,195; Prem Exports, 4,000 Kgs., Rs. 1,01,597; Deluxe Sales Corpn., 17 Mts., Rs. 2,46,422.

POLYSTYROL: From Korea: BASF India Ltd., 800 Kgs., Rs. 15,644.

POLYSTYRENE GRANULES: From Korea: Punga Trading Syndicate, 10 Mts., Rs. 1,68,406.

POLYURETHANE RESIN: From Malaysia: Colgate Palmolive (I) Ltd., 10 Nos., Rs. 29,706.

PVC: From Mexico: Fenoplast Pvt. Ltd., 49.4 Mts., Rs. 8,78,602.

PVC RESIN: From Brazil: Bajrang Plastics Pvt. Ltd., . 112 Mts., Rs. 13,55,511; Pearl Agencies, 1 Mts., Rs. 13,55,333; From Fran Evenmore Pipe Systems Pvt. Ltd., Mts., Rs. 2,07,472; From Mexi Andhra Pipes Ltd., 116.65 M Rs. 13,94,286; From USA: Prem Credits Ltd., 34 Mts., Rs. 3,97,5 From Japan: Phiroze Sethra Pvt. L 12 Mts., Rs. 3,49,272; From Fran Royal Cushion Vinyl Products, Mts., Rs. 63,96,040.

PVC SUSPENSION RESIN: Fr Mexico: Premier Vinyl Flooring L 304 Mts., Rs. 36,79,566; From US Saurabh Polypipes Pvt. Ltd., 85, Kgs., Rs. 9,33,650; From Mexi Tainwala Chem & Plastics, 99.9 M Rs. 12,08,713.

SYTRENE ACRYLONITR CO-POLYMER: From Spain: J Plastics, 18 Mts., Rs. 4,33,493.

---

## MATERIALS EXPORTED
## BOMBAY
## 17.2.90

---

ALUMINIUM CHLORIDE: Felixstowe: Aroni Chemicals, 19 Kgs., Rs. 2,85,882.

ALUMINIUM CHLOR ANHYDROUS: To Felixstowe: Chemicals Pvt. Ltd., 18,150 Rs. 2,96,436.

ALUMINIUM PHOSPHITE: Kuwait: United Phosphorous Ltd. Kgs., Rs. 1,14,474.

ALUMINIUM CHLORIDE: Felixstowe: Mangalam Inorganic Ltd., 35,000 Kgs., Rs. 5,25,654.

CYPERMETHRIN TECH: Bangkok: United Phosphorus 1,500 Kgs., Rs. 11,15,255.

DIETHYLENETRIAMINE: Antwerp: Diamines & Chemical 20,000 Kgs., Rs. 9,53,191.

4 DIHYDROXY AQ: To Felix Indian Dyestuff Inds., 5,500 Rs. 5,59,000.

FATTY ACID: To Hamburg:

Thermomet
Fuel Saving
Steam Boilers
Range Covers upto 1000 Kgs/hrs in Non-IBR Design.
- Efficiency-guaranteed 87%
- Life long after sales service.
Also offers:-
- Oil fired thermic fluid heater upto 10,00,000 K. Cals/hr.
- Hot Water Boilers Oil/Coal
- Electrode Boilers.
- Vertical/Horizontal Manual Oil/Coal/Husk Wood fired Boilers upto 1000 Kgs/hr.
- Waste heat recovery Boiler
Thermopac BOILERS
1. Dharam Palace, Shantivan, Near National Park, Borivli (E).
Bombay-400 066, Tel: 664041
Agarwal 'Ad'

Mills, 21.130 Mts., Rs. 5,36,723; To terdam: Bubna Enterprises, 16,000 ., Rs. 7,04,340.

OOD COLOUR: To Dubai: Pravinndra Jethalal & Co., 30 Kgs., 5,400.

ENVALERATE TECHNICAL: To siung: United Phosphorous Ltd., Kgs., rs. 80,700.

AMMA ACID: To Le Havre: Lib- Exports Ltd., 10,791.1 Kgs., 18,03,607.

HEXA CHLOROETHANE: To bai: Scottish Chemical Inds., 20,000 s., Rs. 3,35,000.

ODO CHLOROHYDROXYQUI- LINE USP: To Jakarta: Amphray bs, 1,000 Kgs., Rs. 3,01,702.

LINDANE TECHNICAL: To Antrp: India Pesticides Pvt. Ltd., 16,000 s., Rs. 16,80,851.

META AMINO PHENOL: To Hamrg: Hindustan Organic Chemicals d., 2,000 Kgs., Rs. 3,73,506.

METANILIC ACID: To Rotterdam: evan Products, 14,000 Kgs., . 6,78,456.

METANILIC ACID DRY: To Rotrdam: Liberty Exports Ltd., 14,000 gs., Rs. 7,41,483.

METANILIC ACID POWDER: To amburg: Sadhana Nitro Chem Ltd., ,000 Kgs., Rs. 7,68,110.

META PHENYLENE DIAMINE: o Rotterdam: Liberty Exports Ltd., 2,850 Kgs., Rs. 16,88,376.

NICOTINE ALKALOID 95%: To e Havre: Nicosulf Industries & xports, 2,000 Kgs., Rs. 3,98,297.

OXALIC ACID: To Hamburg: aharashtra Aldehyde & Chemicals, 28 ts., Rs. 42,84,000.

POTASSIUM IODIDE USP: To usan: Amphray Labs, 500 Kgs., s. 1,28,680.

SODIUM CYANIDE TABLETS: To La Guaira: Cyanides & Chemicals Co., 61,940 Kgs., Rs. 19,45,179.

VINYL SULPHONE ESTER: To Jakarta: Hub Dyes & Chemicals Pvt. Ltd., 5,347 Kgs., Rs. 4,90,349.

---

## DRUGS MATERIALS EXPORTED BOMBAY

17.2.90

AMPICILLIN TRIHYDRATE: To Antwerp: Supriya Drugs & Pharmaceuticals, 500 Kgs., Rs. 4,39,490.

CINEOLE BPC: To Felixstowe: Kosan Inds. Ltd., 2,700 Kgs., Rs. 4,62,863.

ETHAMBUTOL HCL BP: To Rotterdam: Themis Chemicals Ltd., 1,000 Kgs., Rs. 5,71,927.

ERYTHROMYCIN STEARATE BP 80: To Hamburg: Mehta Pharmaceuticals Inds., 1,000 Kgs., Rs. 9,15,000.

GUANIDINE NITRATE: To Hamburg: Explogel India, 20 Mts., Rs. 6,12,766.

IBUPROFEN BP 66: To Hamburg: Seshsaria Chemicals Pvt. Ltd., 2,000 Kgs., Rs. 4,20,000.

IBUPROFEN BP 88: To Copenhagen: Inventaa Chemicals Pvt. Ltd., 3,000 Kgs., Rs. 6,62,000.

MENTHOL CRYSTALS BP: To Hamburg: Bhagat Fine Chemicals, 3,000 Kgs., Rs. 9,45,000.

PHENYLBUTAZONE USP: To Hamburg: Nukem Chemical Inds., Ltd., 5,000 Kgs., Rs. 14,74,894.

POTASSIUM IODIDE USP: To Busan: G. Amphray Labs., 2,000 Kgs., Rs. 5,57,940.

SULPHAMETHOXAZOLE B.P. 88: To Copenhagen: Apte Amalgamations, 5,000 Kgs., Rs. 10,86,110.

SULPHAMETHOXAZOLE BP 88: To Hamburg: Siris Ltd., 46,000 Kgs., Rs. 88,50,670.

**AVAILABLE**

Ready Stock
**Methylene Chloride**
99% Purity
in 250 Kg. Net wt. (Drum)

Contact for your regular requirements
**GLOBLE AGENCIES**
Pooran Asha Building,
31/, Narsi Natha Street, Bombay-400 009.
Phone: 335061 (10 LINES) Gram: INCHEMOX
Telex: 11-76723 CHMX IN Fax: 91-22-855 89 38

FOR QUALITY PRODUCTS AND COMPETITIVE RATES

DI BUTYL PHTHALATE (D.B.P.)
DI OCTYL PHTHALATE (D.O.P.)
DI OCTYL SEBACATE (D.O.S.)
DI BUTYL SEBACATE (D.B.S.)
BUTYL STEARATE
DI OCTYL MALEATE (D.O.M.)
DI BUTYL MALEATE (D.B.M.)
DI OCTYL ADIPATE (D.O.A.)
DI BUTYL ADIPATE (D.B.A.)
OCTYL ACETATE
OCTYL STEARATE

CONTACT MANUFACTURERS

**Enbichem Industries**

219/224, Madhani Estate, 54 ., S.B. Marg, P.B. No. 7039
Dadar, Bombay - 400 028
**Phone: 4225392 / 4228968**

For your regular requirements of

**Piperazine Citrate I.P.**
**Piperazine Adipate I.P.**
**Piperazine Phosphate I.P.**
**Piperazine Hydrate I.P.**
**Iron Choline Citrate 66% Solution**
**Choline Theophylline Pure**
**Metronidazole Benzoate I.P.**
**Benzyl Benzoate I.P.**

Export Enquiries Solicited
Contact Manufacturers

**J.P. PHARMA-CHEM INDUSTRIES**

**Office:** 12, Alka 'A' Opp. N.L. High School, S.V. Road, Malad (W), Bombay 400 064. **Phone: 6827129**
**Factory:** T-108, M.I.D.C., Tarapur, Boisar, Dist. Thane (Mah.).

**Sole Selling Agent**

**M/s. SHRADHA PHARMA**

B-12, Bhangwadi, Kalbadevi Road, Bombay 2. **Phone: (O) 258971 (R) 6825558**

For your requirements of

**Sodium Pentachloro Phenate (Sentobrite) SPCP**
**Pentachloro Phenate (PCP) Powder & Liquid**
**Trichloro Phenate (TCP) Powder & Liquid**

**Assured Quality - Prompt Supply**

Kindly Contact

**M/s. Patels & Thapa Chemical Industries**

3/11, G.I.D.C., Sarigam - 396 155.
Ta. Umergam, Dist. Valsad, Gujarat State.
**Phone No.: 67 (Bhilad Exchange)**

# BENZOYL PEROXIDE

We supply Excellent Quality
Quality Cautious Consumers for your Bulk Requirement

Contact Manufacturers

## ROMA CHEM INDUSTRIES

Regd. Office: 22/1044, Punjabi Colony,
G.T.B. Nagar, Bombay 400 037.
**Phones: 4073074/4092216/4093914 Resi: 483095**

**Sales Office:** Municipal Bldg., C-1, Shop No. 2 & 3,
Near Sardar Nagar No. 4, G.T.B. Nagar, Bombay 400 037.

---

*READILY AVAILABLE*

| | |
|---|---|
| **M.E.K. PEROXIDE** | **METHYL ETHYL KETONE PEROXIDE** |
| **B.P. POWDER** | **BENZOYL PEROXIDE POWDER** |
| **B.P. PASTE** | **BENZOYL PEROXIDE PASTE** |
| **T.B.H.P.** | **TERTIARY BUTYL HYDRO PEROXIDE** |
| **D.T.B.P.** | **DI TERT BUTYL PEROXIDE** |
| **T.B.P.B.** | **TERTIARY BUTYL PER BENZOATE** |
| **L.P.O.** | **LAURYL PEROXIDE** |
| **C.H.P.** | **CYCLO HEXANONE PEROXIDE** |

Please Contact:

## SHEIRAJ CHEMICALS & PHARMACEUTICALS PVT. LTD.

*Office:* 503-A, Stock Exchange Building, 5th Floor, Dalal Street, Bombay 400 023.
**Phone: 272451/275545. Telex: 5900 GURU IN.**
*Factory:* W-265, T.T.C. Industrial Area, Rabale, Thane (M.S.)

---

## SILICA GEL

(a) Indicative Type
(b) Non-Indicative Type
(c) Powder upto 400 Mesh
The product meet all Physical and Chemical analysis of imported Silica Gel

## PRECIPITATED SILICA

of High Purity suitable to
(a) Rubber
(b) Pesticides
(c) etc.

Description : Almost colourless crystals
Silica as $SiO_2$ : 99.18% w/w
Iron as $Fe_2O_3$ : 0.025% w/w
Aluminium as $Al_2O_3$ : 0.025% w/w
Calcium as CaO : Negligible
Sodium as $Na_2O$ : Negligible
Titanium as $TiO_2$ : Negligible
Bulk Density : 0.7407 gm.
Water Adsorption
at 80% RH : 36.85% w/w
at 60% RH : 30.59% w/w
at 50% RH : 29.00% w/w
at 40% RH : 26.53% w/w
at 20% RH : 22.87% w/w

## HARCHEM

*Factory:* E-7(A) Road No. 1, Vishwakarma Ind. Area, Jaipur-302 013. **Phone: 832865**
*Bombay Office:* 29, Merry Land, R.G. Thadani Marg, Worli, Bombay 400 018.
Ph: 4939641

AMMONIUM NITRATE (RCF Melt)
FERROUS AMMONIUM SULPHATE
MAGNESIUM SULPHATE
MANGANESE SULPHATE
NICKEL SULPHATE & HYPO
POTASSIUM NITRATE/NITRITE
STRONTIUM CHLORIDE
ZINC CARBONATE/CHLORIDE
ZINC OXIDE & BORAX
ZINC SULPHATE (Fert/Monohydrate/Iron Free)

**L C TRADERS**
(Chemicals Division)
403, "YOGESHWAR"
135/139, Kazi Sayed Street, Bombay 3.
Tel.: Off.: 331195/326542
Grams: "SULPHATES" — Chinch Bunder

WANTED

TECHNICAL KNOW-HOW FOR
ALUMINIUM CHLORIDE ANHYDROUS
POWDER AND GRANULES

Persons having actual plant experience preferred
Interested parties contact at:

BOX NO. 1261
CHEMICAL WEEKLY
306, Shri Hanuman Industrial Estate,
G.D. Ambekar Road, Wadala, Bombay 400 031.

POTASH ALUM - 99% Min.
SODIUM NITRITE (As per ISI)
Barium Carbonate 98%
Calcium Chloride
Manganese Sulphate
Sodium Sulphide Flakes (Iron Free)
Sulphur Black

VORA CHEMI TRADE
PVT. LTD.

265, Samuel Street, Bombay 400 003.
Phones: 333762/63/64/325265/345377

*Where Quantity & Quality Matter*
*always Count on....*

KC
KRIPA'S

## ACID SLURRY

## SODIUM LAURYL SULPHATE
(POWDER, NEEDLES & LIQUID)

## SODIUM LAURYL ETHOXY SULPHATE

## INDUSTRIAL DETERGENT 40%
HOUSE HOLD DETERGENT POWDER
SPRAY DRIED - 25 Kgs. BULK PACKING

KC
KRIPA'S

**KRIPA CHEMICALS PVT. LTD.**

**Admn. Office:**
8/9/10 'Royal Chambers'
S. No. 47, Paud Rd., PUNE-411038
**Phones; 333245, 331825, 331855**
**Telex: 0145-729 KRIPIN**

**Branch Office:**
House No. 1024, 10th Main Road,
West of Chord Road, IIIrd Stage, 1st Block,
Bangalore-560079 **Phone: 357393**

T-DESIGN

INDIAN
OCEAN

**Citric Acid from Citurgia. The name that spells international quality.**

The name Citurgia is today synonymous with Citric Acid of the finest quality.

Citurgia caters to more than just one need in more than just one industry. Besides the traditional usage of Citric Acid in food, soft drinks, confectionery and drugs, today the uses of Citric Acid extend to new areas.

- In the textile printing and dyeing industry it provides 'STABLE pH' conditions for polyester and nylon. As also for acrylic prints curing and cotton-resist printing. Citric Acid has successfully replaced imported Tartaric Acid because of its excellent quality, low costs and easy availability. Also, it is a very safe acid compared to other organic and inorganic acid salts.
- Citric Acid prevents flavour deterioration, rancidity and discoloration in edible oils.
- It imparts an acidic taste to dry powdered drinks.
- It is also used as a descaling solution.

Citurgia Biochemicals Ltd. is the largest producer of high quality Citric Acid in India. Besides catering to the domestic demand, Citurgia's Citric Acid is exported to USA, Japan, Germany, Australia, Iran, Malaysia, Sri Lanka and other countries.

**Citurgia Citric Acid-India's No. 1**

CITURGIA BIOCHEMICALS LIMITED
Regd. Off. Neville House, J.N. Heredia Marg, Ballard Estate, Bombay-400 038
Tel 2618071 Gms: CITURGIA BOMBAY Tlx: 11-73372 BDM IN